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Phytoplankton Species Composition and Abundance Along the Pacific Coast of Canada, 1979 - 1989

Volume 1: 1979 - 1984

J.R. Forbes and R.E. Waters

Institute of Ocean Sciences
Department of Fisheries and Oceans
Sidney, B.C.

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Canadian Data Report Of Hydrography and Ocean Sciences

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Les établissements des Sciences et Levés océaniques dans les régions et à l'administration centrale ont cessé de publier leurs diverses séries de rapports depuis décembre 1981. Vous trouverez dans l'index des publications du volume 38 du *Journal canadien des sciences halieutiques et aquatiques*, la liste de ces publications ainsi que le dernier numéro paru dans chaque catégorie. La nouvelle série a commencé avec la publication du Rapport n° 1 en janvier 1982.

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VOLUME 1: 1979 - 1984

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Sidney, B.C.

Authors' addresses:

J.R. Forbes
Department of Fisheries and Oceans
Institute of Ocean Sciences
P.O. Box 6000
Sidney, B.C., Canada, V8L 4B2

R.E. Waters
80 Manor Way
Onslow Village, Guildford
Surrey, GU2 5RR, U.K.

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Abstract

Forbes, J.R., and R.E. Waters. 1993. Phytoplankton species composition and abundance along the Pacific coast of Canada, 1979 - 1989. Volume 1: 1979 - 1984. Can. Data Rep. Hydrogr. Ocean Sci. 117 (Vol. 1): 212p.

Phytoplankton species composition and abundance data from samples collected in coastal waters of British Columbia from 1979 to 1989 are presented. Data from two cruises in the subarctic Pacific Ocean are also provided. We include data on associated water properties (salinity, temperature, chlorophyll, inorganic nutrients, particulate organic nitrogen and particulate organic carbon) as available. Results for 1979 to 1984 and details of sampling and analytical procedures are given in volume 1. Results from 1985 to 1989 are presented in volume 2.

Key words: phytoplankton, taxonomy, distribution, water properties

Résumé

Forbes, J.R., and R.E. Waters. 1993. Phytoplankton species composition and abundance along the Pacific coast of Canada, 1979 - 1989. Volume 1: 1979 - 1984. Can. Data Rep. Hydrogr. Ocean Sci. 117 (Vol. 1): 212p.

On présente des données sur la composition en espèces et sur l'abondance du phytoplancton résultant de l'analyse d'échantillons prélevés dans les eaux côtières de la Colombie-Britannique de 1979 à 1989. Il y a également des données recueillis au cours de deux expéditions dans la région subarctique de l'océan Pacifique. S'ajoutent les données existantes sur les propriétés connexes de l'eau (salinité, température, teneur en chlorophylle, matières nutritives inorganique, azote organique en particules et carbone organique en particules). Dans le volume 1, on donne les résultats des analyses de 1979 à 1984 ainsi que des détails sur les méthodes d'échantillonnage et d'analyse. Les résultats des analyses de 1985 à 1989 sont présentés dans le volume 2.

Mot-clés: phytoplancton, taxonomie, distribution, propriétés de l'eau

Acknowledgements

We thank fellow taxonomists who contributed to the data set: Merelene Austin, Judy Akerman and Rowan Haigh. Leslie Brown, Patricia Smith and Dr. F.J.R. (Max) Taylor provided assistance with some taxonomic problems. Access to the Northeast Pacific Culture Collection facilitated work with live material. We also appreciate the assistance of staff of the Ocean Environment and Fisheries section, along with numerous students and contractors, who were involved with sampling or analysis of associated water samples. Samples were collected from the C.S.S. *Parizeau*, C.S.S. *Vector*, C.S.S. *John P. Tully*, C.S.S. *Revisor*, F.P.V. *Walker Rock*, M.V. *Ocean King* and M.V. *Bastion City*. We thank personnel of these vessels for their assistance.

Introduction

The Ocean Environment and Fisheries section of the Institute of Ocean Sciences has been involved in continuing studies of the control by oceanographic processes of the planktonic ecosystem over the continental shelf of British Columbia. As part of this work, we have collected phytoplankton samples to determine the species composition and abundance of the phytoplankton community. In addition, a number of short term projects have included collection of phytoplankton samples in both nearshore waters and oceanic waters of the subarctic Pacific. This report provides detailed data on the abundance and species composition of photoautotrophic plankton samples collected from 1979 to 1989 (Vol.1: 1979-1984; Vol. 2: 1985-1989), together with associated physical and chemical data. Obligately heterotrophic taxa have been excluded.

Some of these data have been published previously in conjunction with reports on specific cruises or projects (Hill et al. 1982a, b, Hill et al. 1983, Denman et al. 1985, Forbes et al. 1988, Forbes et al. 1990a, b). However, this report will enable the complete set of data to be archived in one place and available for comparison. In addition, there have been a number of changes in nomenclature and corrections to the data.

Data collected with the phytoplankton samples varied according to changing research objectives. Generally included were temperature, salinity and chlorophyll *a*. Concentrations of dissolved inorganic nitrogen (nitrate plus nitrate), phosphorus (orthophosphate) and silicon (reactive silicate), as well as dissolved oxygen and radioactive carbon uptake rates, were frequently determined.

Methods

1. Sampling strategies and navigation

Our sampling has been concentrated off the west coast of Vancouver Island and in the Strait of Georgia (Fig. 1), with less dense coverage in other coastal waters. Few samples have been taken in coastal inlets or near shore. Exceptions include several samples taken in Alice Arm on the extreme north coast in August 1981, a few samples collected in Saanich Inlet on southeast Vancouver Island at various times, and an extensive set of samples from Barkley Sound on the west coast of Vancouver Island acquired in May 1988. Data from two cruises to Ocean Station P (50° N, 145° W) in the subarctic Pacific are also included here. Records are restricted to the months from April to October (Table 1), with 95% of samples taken between May and August.

As noted above, the samples reported here were collected in a variety of projects and for differing goals. In general, however, where a single sample was obtained at a location, it was collected in the upper mixed layer. Additional samples were frequently collected within and below the pycnocline.

Table 1: Distribution of samples by area and month

	April	May	June	July	August	September	October	TOTAL
Strait of Georgia		76	10	63				149
West coast Vancouver Island	5	132	127	118	199	20	18	619
Central and north coasts			14	71	3			88
Subarctic Pacific		42	27					69
TOTAL	5	250	178	252	202	20	18	925

The majority of samples were collected from large vessels, with positioning established by Loran-C. In near-shore situations, positioning was supported by radar and, occasionally, visual bearings.

2. CTD/rosette casts and discrete water samples

Vertical profiles of physical, chemical and biological data were collected with an integrated array of instruments, mounted in a frame attached to a rosette sampler. A microcomputer on the vessel stored the data and provided real-time display of temperature, salinity and chlorophyll fluorescence. In general, the instruments in the array were a Guildline model 8701 analog CTD, a Variosens III fluorometer, a Sea Tech 25cm path length transmissometer to measure beam attenuance, and a Licor 193SB spherical quantum sensor, to measure *in situ* photosynthetically active irradiance. During a typical cast, the instrument package was lowered at a rate of 0.5 to 1 $cm.s^{-1}$, and the depths to collect water samples were determined from data acquired on the down cast. The rosette sampler held an array of ten Niskin or Go-Flo bottles. One or more of these bottles was tripped on the up cast and data from all sensors were sampled and recorded at the time the bottle closed. Water collected in the bottles was used for discrete samples of one or more of salinity, chlorophyll *a*, dissolved inorganic nutrients, bacteria, particulate organic carbon and nitrogen, and phytoplankton identity and abundance.

The manufacturer of the CTD specifies an accuracy of $\pm 0.01°$ C, with a resolution of 0.003° C for temperature, an accuracy of ± 1.25dBar and a resolution of 0.25dBar for pressure, and an accuracy of ± 0.01 psu for salinity, with a resolution of 0.005psu.

3. Seawater loop samples

Samples were collected from vessel seawater loops in association with continuous underway mapping operations of near surface water properties. Continuous underway data of zooplankton abundance and size categories, salinity, temperature and chlorophyll fluorescence were collected with a flow-through electronic particle counting system (EPCS) (Mackas et al. 1981) coupled to temperature, conductivity and fluorescence sensors (Mackas et al. 1980). Water was pumped from a nominal depth of 1 to 3m via a through-hull fitting in the bow thruster compartment, or from a hose mounted on a strut attached to side of the ship. This type of mapping was usually performed at night, as the primary objective was to map the horizontal distribution of vertically migrating zooplankton.

Periodic discrete water samples were taken from the system outflow for calibration of the electronic sensors, as well as supplementary data such as dissolved inorganic nutrients and phytoplankton identity and abundance. On occasion, bucket samples were also taken from over the side of the ship, to enable comparison of surface and near-surface water properties.

4. Phytoplankton taxonomic and abundance samples

Phytoplankton samples were collected in vials or bottles of 20 - 250mL. Samples were preserved with acidic Lugol's fixative (Throndsen 1978). Selected duplicate samples from oceanic waters were preserved with neutral Lugol's fixative, to improve identification and quantification of taxa with calcareous parts.

Identification and enumeration of taxa was by settling and inverted microscopy (Hasle 1978). Specifically, a subsample of between 2 and 50mL (usually 10mL) was settled in a settling chamber. The volume settled was chosen to yield between 100 and 300 cells or chains of the more abundant medium sized species (chain or cell volume 1000 μm^3 - cell volume 10000 μm^3) present. In cases of extremely low concentration, successive sedimentations through a 50mL cylinder into the same 2mL chamber were performed. When cell concentrations were unacceptably dense, samples were diluted in filtered (0.45μm membrane filter) seawater containing Lugol's solution. Wherever possible a minimum of 400 cells, chains and colonies was counted.

Medium sized, large, rare and exotic species were enumerated from the entire bottom of the settling chamber at 300X magnification. For species exceeding 200 individuals or colonies, every second, fifth or tenth transect (for $^1/_2$, $^1/_5$ or $^1/_{10}$ of the chamber respectively) were counted. Smaller species were counted at 312.5X or 500X ($^1/_{20}$ to $^1/_2$, or $^1/_{57}$ to $^1/_{14}$ of the chamber respectively) from one or more transects.

Analytical methods varied slightly for samples collected in 1988. In this year, nanoflagellates were counted at 480X using random fields until a total of 200 specimens had been enumerated. Larger specimens were counted at 192X using a grid of 45 or 93 coordinates (depending on cell concentrations), which effectively represented $^1/_2$ or the entire chamber bottom. For larger and rarer species, the entire chamber bottom was scanned at low power (75.6X).

The species encountered, together with the abbreviations used in the taxonomic tables, are listed in Table 2. The taxonomic references consulted follow the list of references cited.

All samples collected in 1979 were analysed by M. Austin. Selected samples collected in 1980 were analysed by J. Ackerman. All samples collected in 1988 were analysed by R. Haigh. All other samples were analysed by R.E. Waters.

5. Salinity

Salinity samples were collected in 250mL bottles, which were rinsed three times, capped and stored for later analysis at the Institute of Ocean Sciences. Salinity samples were analyzed on a Guildline Autosal (model 8400A) salinometer, standardized against IAPSO Normal Standard Seawater (presently prepared by Ocean Scientific International Ltd., Wormley, Godalming, U.K.). Data are reported in practical salinity units (psu) (Lewis and Perkin 1978). Precision (pooled variance of replicate samples) of this method is estimated to be 0.005 (Macdonald et al. 1988).

6. Chlorophyll *a*

Extracted chlorophyll *a* was determined by fluorometry (Parsons et al. 1984). Water samples (25 - 250mL) were filtered onto 25mm diameter Whatman 934AH (1979 - 1984) or GF/F (1984 - 1989) glass fiber filters, with a vacuum of <100mm Hg. Just before filtration was completed approximately 1mL of $MgCO_3$ suspension was added to the sample and the sides of the filter funnel were rinsed with filtered seawater. Chlorophyll was extracted in 90% aqueous acetone by grinding the filters in a tissue grinder. The extract was clarified by filtration through a glass fiber filter and the fluorescence measured in a Turner Designs 10 fluorometer. The sample was acidified with 2 drops of 1.5N HCl and the fluorescence was redetermined after the reading had stabilized, to obtain a phaeopigment correction factor.

Chlorophyll *a* content was calculated from the equations in Parsons et al. (1984). The fluorometer was previously calibrated against a Perkin-Elmer Hitachi 200 spectrophotometer using standard prepared from pure crystalline chlorophyll *a* (Sigma Chemical Co.). Chlorophyll concentrations in the calibration samples were calculated using the equations of Jeffrey and Humphrey (1975). The mean coefficient of variation of this method is estimated to be 4.9% (Forbes et al. 1988).

7. Inorganic nutrients

Samples for the analysis of dissolved nitrate plus nitrite, orthophosphate and reactive silicate were analyzed using Technicon II Auto-Analyzer instruments. Processing of samples usually involved freezing, for later analysis on shore, but on occasion we analyzed fresh samples on board ship.

TABLE 2: PHYTOPLANKTON TAXONOMIC LIST (WITH ABBREVIATIONS USED IN DATA RECORDS)

* indicates information listed in text in notes on taxonomy (p. 13)
Tax. ref. no. refers to taxonomic references consulted (p. 19)
NEPCC numbers refer to Northeast Pacific Culture Collection accession numbers

	Tax. ref. no.	Abbreviations in data records
Cyanobacteria		
Cyanophyceae		
Chroococcales		
Chroococcaceae		
Synechococcus spp.	63	synechococ spp.
Nostocales		
Oscillatoriaceae		
Oscillatoria spp.	63	oscillator spp.
Nostocaceae		
Anabaena spp.	63	anabaena spp.
Nostoc sp.	63	nostoc sp.
Chrysophyta		
Chrysophyceae		
Solenicola setigera		solenicola setigera
Ochromonadales		
Ochromonadaceae		
Ochromonas spp.	4	ochromonas spp.
Dinobryaceae		
Dinobryon spp.		
Dinobryon divergens	63	dinobryon divergens
Dinobryon sertularia	63	dinobryon sertularia
Dinobryon suecicum	50	dinobryon suecicum
Dictyochales		
Dictyochaceae		
Dictyocha fibula	18	dictyocha fibula
Dictyocha speculum (formerly Distephanus)	18	dictyocha speculum
Chromulinales		
Pedinellaceae		
Chrysophyceae NEPCC sp. 223		pedinellac sp.223
Chrysophyceae NEPCC sp. 239		pedinellac sp.239
Apedinella spinifera	70	apedinella spinifera
Pseudopedinella pyriformis	11	pseudopedi pyriformis
Xanthophyta		
Xanthophyceae		
Mishcococcales		
Pleurochloridaceae		
Meringosphaera mediterranea	14	meringosph mediterranea
Haptophyta		
Haptophyceae		
Isochrysidales		
Gephyrocapsaceae		
Emiliania huxleyi (formerly Coccolithus)	46	emiliania huxleyi
Imantonia rotunda *	21, 65	imantonia rotunda

Table 2 cont.

Dicrateria sp. *	21, 54	dicrateria sp.	
Prymnesiales			
Prymnesiaceae			
Corymbellus sp *		corymbellu sp.	
Corymbellus aureus	20	corymbellu aureus	
Chrysochromulina spp. *	59,60	chrysochro spp.	
Chrysochromulina sp.1		chrysochro sp.1	
Prymnesium spp.	6, 41	prymnesium spp.	
Phaeocystaceae			
Phaeocystis pouchetii	48	phaeocysti pouchetii	
Coccosphaerales			
Zygosphaeraceae			
Crystallolithus hyalinus	56	crystallol hyalinus	
Coccolithaceae			
Coccolithus pelagicus	56	coccolithu pelagicus	
Cyclococcolithus leptoporus	45	cyclococco leptoporus	
Bacillariophyta			
Bacillariophyceae			
Centrales			
Centrales spp.		centrales spp.	
Cymatosiraceae			
Leyanella arenaria *	36	leyanella arenaria	
Minutocellus sp.		minutocell sp.	
Minutocellus scriptus *	36	minutocell scriptus	
Corethronaceae			
Corethron criophilum	12, 38	corethron criophilum	
Leptocylindraceae			
Detonula pumila (formerly Schroederella delicatula)	12	detonula pumila	
Leptocylindrus danicus	12	leptocylin danicus	
Leptocylindrus danicus (spores)		leptocylin danicus	spores
Leptocylindrus minimus	12	leptocylin minimus	
Leptocylindrus mediterraneus (formerly Dactyliosira)	12	leptocylin mediterraneu	
Coscinodiscaceae			
Melosira spp.	12, 42	melosira sp.	
Melosira moniliformis	12	melosira moniliformis	
Paralia sulcata (formerly Melosira)	12	paralia sulcata	
Stephanopyxis spp.	12	stephanopy spp.	
Stephanopyxis nipponica	12	stephanopy nipponica	
Stephanopyxis palmeriana	12	stephanopy palmeriana	
Stephanopyxis turris	12	stephanopy turris	
Cyclotella sp.? 3 – 5um		cyclotella? sp.	3–5
Cyclotella sp. 2 *		cyclotella sp.	
Cyclotella caspia	38	cyclotella caspia	
Skeletonema costatum	12	skeletonem costatum	
Thalassiosira spp.	12	thalassios spp.	
Thalassiosira sp. 1		thalassios sp. 1	
Thalassiosira sp. 2		thalassios sp. 2	
Thalassiosira aestivalis	12, 28	thalassios aestivalis	
Thalassiosira angstii	15	thalassios angstii	

Table 2 cont.

	Thalassiosira angulata	28	thalassios angulata	
	Thalassiosira anguste–lineata	12,17	thalassios anguste–line	
	Thalassiosira baltica	29	thalassios baltica	
	Thalassiosira binata	32	thalassios binata	
	Thalassiosira conferta	32	thalassios conferta	
	Thalassiosira constricta	37	thalassios constricta	
	Thalassiosira decipiens	30	thalassios decipiens	
	Thalassiosira eccentrica / T. symmetrica	16	thalassios eccentrica	/symmetrica
	Thalassiosira elsayedii	15	thalassios elsayedii	
	Thalassiosira leptopus	33	thalassios leptopus	
	Thalassiosira lineata	33	thalassios lineata	
	Thalassiosira mendiolana	16	thalassios mendiolana	
	Thalassiosira minuscula	27	thalassios minuscula	
	Thalassiosira nordenskioldii	12, 28	thalassios nordenskiold	
	Thalassiosira pacifica	19, 28	thalassios pacifica	
	Thalassiosira pseudonana *	34	thalassios pseudonana	
	Thalassiosira rotula	12	thalassios rotula	
	Thalassiosira subtilis	26	thalassios subtilis	
	Thalassiosira tenera	33	thalassios tenera	
	Thalassiosira weissflogii	17	thalassios weissflogii	
	Coscinodiscus spp.	12, 42	coscinodis spp.	
	Coscinodiscus asteromphalus	42	coscinodis asteromphalu	
	Coscinodiscus granii	12	coscinodis granii	
	Coscinodiscus radiatus	12	coscinodis radiatus	
	Coscinodiscus thorii	42	coscinodis thorii	
Leprocylindraceae				
	Lauderia borealis	12	lauderia borealis	
Actinodiscaceae				
	Actinoptychus senarius	12	actinoptyc senarius	
	Actinoptychus splendens	12	actinoptyc splendens	
Asterolampraceae				
	Asteromphalus sp. 1		asterompha sp. 1	
	Asteromphalus heptactis	12	asterompha heptactis	
Biddulphiaceae				
	Biddulphia spp.	12, 42	biddulphia spp.	
	Biddulphia aurita	12	biddulphia aurita	
	Biddulphia longicruris	12	biddulphia longicruris	
	Eucampia spp.	12	eucampia spp.	
	Eucampia zoodiacus	12	eucampia zoodiacus	
	Hemiaulus membranaceus	12	hemiaulus membranaceus	
	Cerataulina pelagica (formerly C. bergonii)	12	cerataulin pelagica	
	Ditylum brightwellii	12	ditylum brightwellii	
Chaetoceraceae				
	Chaetoceros spp. (cells)	5,12,38,42	chaetocero spp.	cells
	Chaetoceros spp. (chains)	5,12,38,42	chaetocero spp.	chains
	Chaetoceros spp. (spores)	12,38,42	chaetocero spp.	spores
	Chaetoceros sp. a		chaetocero sp.a	
	Chaetoceros sp. b		chaetocero sp.b	
	Chaetoceros sp. c		chaetocero sp.c	
	Chaetoceros sp. d		chaetocero sp.d	
	Chaetoceros sp. e		chaetocero sp.e	

Table 2 cont.

	Chaetoceros sp. f		chaetocero sp.f	
	Chaetoceros sp. gi		chaetocero sp.gi	
	Chaetoceros sp. gii *		chaetocero sp.gii	
	Chaetoceros sp. h		chaetocero sp.h	
	Chaetoceros sp. j		chaetocero sp.j	
	Chaetoceros sp. k		chaetocero sp.k	
	Chaetoceros sp. l		chaetocero sp.l	
	Chaetoceros sp. m		chaetocero sp.m	
	Chaetoceros sp. n		chaetocero sp.n	
	Chaetoceros affine	12	chaetocero affine	
	Chaetoceros affine v. willei	12	chaetocero affine	v.willei
	Chaetoceros atlanticum	12	chaetocero atlanticum	
	Chaetoceros boreale	38	chaetocero boreale	
	Chaetoceros cinctum / C. crucifer *	12 / 19	chaetocero cinctum	/crucifer
	Chaetoceros compressum	12	chaetocero compressum	
	Chaetoceros constrictum / C. vanheurckii *	12	chaetocero constrictum	/vanheurckii
	Chaetoceros convolutum / C. concavicorne *	12	chaetocero convolutum	/concavicorn
	Chaetoceros curvisetum	12	chaetocero curvisetum	
	Chaetoceros danicum	12	chaetocero danicum	
	Chaetoceros debile	12	chaetocero debile	
	Chaetoceros decipiens	12	chaetocero decipiens	
	Chaetoceros decipiens f. singularis	12	chaetocero decipiens	f.singularis
	Chaetoceros densum	38	chaetocero densum	
	Chaetoceros diadema (formerly C. subsecundus)	12	chaetocero diadema	
	Chaetoceros didymum	12	chaetocero didymum	
	Chaetoceros difficile	12	chaetocero difficile	
	Chaetoceros eibenii	12	chaetocero eibenii	
	Chaetoceros filiforme	38, 42	chaetocero filiforme	
	Chaetoceros laciniosum	12	chaetocero laciniosum	
	Chaetoceros lorenzianum	12	chaetocero lorenzianum	
	Chaetoceros messanensis	12	chaetocero messanensis	
	Chaetoceros pelagicum	12	chaetocero pelagicum	
	Chaetoceros perpusillum	12	chaetocero perpusillum	
	Chaetoceros peruvianum	12	chaetocero peruvianum	
	Chaetoceros pseudocrinitum	38, 42	chaetocero pseudocrinit	
	Chaetoceros radicans	12	chaetocero radicans	
	Chaetoceros rostratum	42	chaetocero rostratum	
	Chaetoceros seiracanthum	12	chaetocero seiracanthum	
	Chaetoceros septentrionale	38, 42	chaetocero septentriona	
	Chaetoceros simile	12	chaetocero simile	
	Chaetoceros simplex	42	chaetocero simplex	
	Chaetoceros sociale	12	chaetocero sociale	
	Chaetoceros subtile	38, 42	chaetocero subtile	
	Chaetoceros teres	12	chaetocero teres	
	Chaetoceros tortissimum	12	chaetocero tortissimum	
	Chaetoceros vistulae	12	chaetocero vistulae	
	Chaetoceros vixvisibile	42	chaetocero vixvisibile	
	Chaetoceros wighami	12	chaetocero wighami	
Bacteriastraceae				
	Bacteriastrum delicatulum	12, 42	bacteriast delicatulum	

Table 2 cont.

Rhizosoleniaceae				
	Rhizosolenia spp.	12, 42	rhizosolen spp.	
	Rhizosolenia alata f. alata	12	rhizosolen alata	f.alata
	Rhizosolenia alata f. curvirostris	12	rhizosolen alata	f.curvirostr
	Rhizosolenia alata f. gracillima	12	rhizosolen alata	f.gracillima
	Rhizosolenia alata f. indica	12	rhizosolen alata	f.indica
	Rhizosolenia bergonii	12	rhizosolen bergonii	
	Rhizosolenia delicatula	12	rhizosolen delicatula	
	Rhizosolenia fragilissima	12	rhizosolen fragilissima	
	Rhizosolenia fragilissima v. 1		rhizosolen fragilissima	v.1
	Rhizosolenia hebetata f. hiemalis	12	rhizosolen hebetata	f.hiemalis
	Rhizosolenia hebetata f. semispina	12	rhizosolen hebetata	f.semispina
	Rhizosolenia setigera	12	rhizosolen setigera	
	Rhizosolenia stolterfothii	12	rhizosolen stolterfothi	
	Rhizosolenia styliformis v. styliformis	12	rhizosolen styliformis	v.styliformi
	Unidentified cylinders *		centrales cylinders	unidentified
Pennales				
	Pennales spp.		pennales spp.	
Fragilariaceae				
	Fragilaria spp.	42	fragilaria spp.	
	Fragilaria lapponica		fragilaria lapponica	
	Synedra spp.	42	synedra spp.	
	Synedra acus	42	synedra acus	
	Asterionella bleakeleyi	42	asterionel bleakeleyi	
	Asterionella formosa	42, 63	asterionel formosa	
	Asterionella glacialis (formerly A. japonica)	12	asterionel glacialis	
	Asterionella kariana	12	asterionel kariana	
	Thalassiothrix frauenfeldii	35	thalassiot frauenfeldii	
	Thalassiothrix longissima	35	thalassiot longissima	
	Thalassionema bacillaris	35	thalassion bacillaris	
	Thalassionema nitzschiodes	35	thalassion nitzschoides	
	Licmophora sp. 1		licmophora sp.1	
	Licmophora abbreviata	12	licmophora abbreviata	
	Striatella unipunctata	12	striatella unipunctata	
	Denticulopsis seminae	68	denticulop seminae	
Diatomaceae				
	Grammatophora spp.	12	grammatoph spp.	
	Grammatophora marina	12	grammatoph marina	
Naviculaceae				
	Naviculaceae spp.	38	naviculace spp.	
	Gyrosigma spp. / Pleurosigma spp.	38	gyrosigma spp.	/pleurosigma
	Navicula calida	38	navicula calida	
	Navicula wawrikae	44	navicula wawrikae	
	Pleurosigma angulatum	38	pleurosigm angulatum	
	Pleurosigma acutum	39	pleurosigm acutum	
	Tropidoneis spp.	38	tropidonei spp.	
	Tropidoneis antartica v. polyplasta	12, 19	tropidonei antarctica	v.polyplasta
	Tropidoneis lepidoptera	12	tropidonei lepidoptera	
Cymbellaceae				
	Amphora spp.	38	amphora spp.	
	Amphora pusio v. parvula	62	amphora pusio	v.parvula

Table 2 cont.

Nitzschiaceae				
	Nitzschia spp.	38	nitzschia spp.	
	Nitzschia americana	23	nitzschia americana	
	Nitzschia bicapitata	23	nitzschia bicapitata	
	Nitzschia brevirostris	43	nitzschia brevirostris	
	Nitzschia closterium	23	nitzschia closterium	
	Nitzschia closterium v. striatula	23	nitzschia closterium	v.striatula
	Nitzschia cylindroformis *	31	nitzschia cylindroform	
	Nitzschia cylindrus	25, 31	nitzschia cylindrus	
	Nitzschia delicatissima (formerly N. actydrophila)	24	nitzschia delicatissim	
	Nitzschia subfraudulenta / N. fraudulenta *	24	nitzschia subfraudulen	/fraudulen
	Nitzschia granii v. curvata	23	nitzschia granii	v.curvata
	Nitzschia heimii	24	nitzschia heimii	
	Nitzschia longissima	23	nitzschia longissima	
	Nitzschia lineola	24	nitzschia lineola	
	Nitzschia norwegica	23	nitzschia norwegica	
	Nitzschia pacifica *	12	nitzschia pacifica	
	Nitzschia pseudodelicatissima (formerly N. delicatula)	24	nitzschia pseudodelica	
	Nitzschia pungens *	24	nitzschia pungens	
	Nitzschia seriata	24	nitzschia seriata	
	Nitzschia seriata f. obtusa *	24	nitzschia seriata	f.obtusa
	Nitzschia subcurvata	23	nitzschia subcurvata	
	Nitzschia subpacifica	24	nitzschia subpacifica	
	Nitzschia turgidula / N. turgiduloides *	24	nitzschia turgiduloide	/turgidula
Bacillariaceae				
	Cylindrotheca fusiformis	64	cylindroth fusiformis	
Chlorophyta				
Chlorophyceae				
Volvocales				
Chlamydomonadaceae				
	Carteria spp.	7	carteria spp.	
Chlorococcales				
Oocystaceae				
	Ankistrodesmus spiralis	63	ankistrode spiralis	
	Ankistrodesmus falcatus v. mirabilis	63	ankistrode falcatus	v.mirabilis
Scenedesmaceae				
	Scenedesmus acuminatus	63	scenedesmu acuminatus	
	Scenedesmus quadricauda v. longispina	63	scenedesmu quadricauda	
Prasinophyta				
Prasinophyceae				
Pyramimonadales				
Nephroselmidaceae				
	Micromonas pusilla? * (formerly Chromulina pusilla)	51	micromonas pusilla?	
	Nephroselmis spp. / Bipedinomonas spp. *	7, 61	nephroselm spp.	/bipedinomona
Polyblepharidaceae				
	Tetraselmis spp. / Pyramimonas spp. *	7, 11	tetraselmi spp.	/pyramimonas
	Cymbomonas spp.	66	cymbomonas spp.	
Halosphaerales				

Table 2 cont.

Pterospermataceae			
	Pterosperma spp. / Pachysphaera spp. *	55, 57	pterosperm spp. /pachysphaera
	Pterosperma cristatum (phycomata) *		pterosperm cristatum (phycomata)
Halosphaeraceae			
	Halosphaera spp.	58	halosphaer spp.
Euglenophyta			
	Euglenophyta spp.	8	euglenophy spp.
	Eutreptiella spp. *	8	eutreptiel spp.
Pyrrophyta			
Dinophyceae			
	Dinophyceae spp. *		dinophycea spp.
Prorocentrales			
Prorocentraceae			
	Prorocentrum spp.	13, 49, 67	prorocentr spp.
	Prorocentrum balticum	49, 67	prorocentr balticum
	Prorocentrum dentatum	49	prorocentr dentatum
	Prorocentrum gracile	49, 67	prorocentr gracile
	Prorocentrum micans	49, 67	prorocentr micans
	Prorocentrum minimum	13, 67	prorocentr minimum
	Prorocentrum nanum	13, 67	prorocentr nanum
	Prorocentrum triestinum	13, 67	prorocentr triestinum
	Prorocentrum vaginulum	67	prorocentr vaginulum
Dinophysiales			
Dinophysiaceae			
	Dinophysis spp. *	13, 49, 67	dinophysis spp.
	Dinophysis acuminata	49, 67	dinophysis acuminata
	Dinophysis infundibulum	67	dinophysis infundibulum
	Dinophysis ovum	49, 67	dinophysis ovum
	Dinophysis parva	67	dinophysis parva
	Dinophysis rotundata	49, 67	dinophysis rotundata
Gymnodiniales			
Gymnodiniaceae			
	'Gonyaulax' rugosum	71	gonyaulax rugosum
	Aureodinium pigmentosum	13	aureodiniu pigmentosum
	Amphidinium spp. *	13,47,49,67	amphidiniu spp.
	Amphidinium sp. m		amphidiniu sp.m
	Amphidinium acutissimum	67	amphidiniu acutissimum
	Amphidinium schroederi	67	amphidiniu schroederi
	Amphidinium stigmaticum	6, 67	amphidiniu stigmaticum
	Cochlodinium spp. *	49, 67	cochlodini spp.
	Cochlodinium citron	65	cochlodini citron
	Gymnodinium spp. *	67	gymnodiniu spp.
	Gymnodinium NEPCC sp. 246		gymnodiniu sp.246
	Gymnodinium sp. r		gymnodiniu sp.r
	Gymnodinium cf. aureolum	40	gymnodiniu cf.aureolum
	Gymnodinium flavum *	71	gymnodiniu flavum
	Gymnodinium gracilentum	10	gymnodiniu gracilentum
	Gymnodinium paulseni	67	gymnodiniu paulseni
	Gymnodinium sanguineum	52	gymnodiniu sanguineum
	Gymnodinium simplex	47, 49	gymnodiniu simplex
	Gymnodinium splendens	49	gymnodiniu splendens
	Gymnodinium vitiligo *	3	gymnodiniu vitiligo

Table 2 cont.

	Gyrodinium spp. *	1, 49, 67	gyrodinium spp.
	Katodinium rotundatum (formerly Gymnodinium minutum)	49	katodinium rotundatum
Ptychodiscaceae			
	Ptychodiscus noctiluca	13, 67	ptychodisc noctiluca
Peridiniales			
Peridiniaceae			
	Peridiniaceae spp. *	13, 49, 67	peridiniac spp.
	Ensiculifera sp.	1	ensiculife sp.
	Scrippsiella sp. u *		scripsiell sp.u
	Scrippsiella trochoidea	67 (fig. c–g)	scripsiell trochoidea
	Heterocapsa triquetra	49	heterocaps triquetra
	Micracanthodinium sp.	13	microcanth sp.
Gonyaulaceae			
	Gonyaulax spp.	49, 67	gonyaulax spp.
	Gonyaulax diegensis	67	gonyaulax diegensis
	Gonyaulax digitale	1, 67	gonyaulax digitale
	Gonyaulax spinifera	1, 67	gonyaulax spinifera
	Gonyaulax triacantha (formerly G. diacantha)	67	gonyaulax triacantha
	Gonyaulax verior	67	gonyaulax verior
	Alexandrium catenella	72	alexandriu catenella
	Alexandrium ostenfeldii	2	alexandriu ostenfeldii
Ceratiaceae			
	Ceratium spp.	1,13,49,67	ceratium spp.
	Ceratium furca	49	ceratium furca
	Ceratium fusus	49	ceratium fusus
	Ceratium kofoidii	67	ceratium kofoidii
	Ceratium lineatum	49	ceratium lineatum
	Ceratium longipes	49	ceratium longipes
	Ceratium minutum	49	ceratium minutum
	Ceratium pentagonum	49	ceratium pentagonum
	Ceratium tripos	49	ceratium tripos
	Ceratium tripos v. baltica	49	ceratium tripos v.baltica
Chloromonadophyta			
Raphidophyceae			
	Heterosigma akashiwo	22	heterosigm akashiwo
	Raphidophyceae sp. 1		raphidophy sp.1
	Raphidophyceae sp. 2		raphidophy sp.2
	Chattonella sp.	53	chattonell sp.
Cryptophyta			
Cryptophyceae			
Cryptomonadales			
	Hemiselmidaceae spp.	9	hemiselmid spp.
	Hemiselmis spp. *	9	hemiselmis spp.
Cryptomonadaceae			
	Cryptomonadaceae spp.	63	cryptomona spp.
	Cryptomonas ovata		cryptomona ovata
Protozoa			
	Mesodinium rubrum	69	mesodinium rubrum

7a. Frozen samples

Samples for the analysis of dissolved nitrate plus nitrite and orthophosphate were collected in 50mL glass tubes with Teflon cap liners. Samples for dissolved reactive silicate were collected in 20mL polystyrene tubes, also with Teflon cap liners. All sample tubes had been previously acid-cleaned and were rinsed three times with sample before filling. All samples were quick frozen in an alcohol bath to -40° C and stored frozen until analysis.

A Technicon II Auto-Analyzer was used for the analyses, with Technicon Industrial Methods No. 186-72 W and 158-71 W (both revised June 1977) employed for nitrate plus nitrite and reactive silicate respectively. The modification of the Technicon method by Brynjolfson (1973) was used for the analysis of orthophosphate. All glassware and plastic ware used was acid-washed overnight in 1 M hydrochloric acid and rinsed three times with deionized (Milli-Q) water before use. Acid-washed sample cups were rinsed with sample before use. The recommendations of Macdonald et al. (1986) regarding the thawing of samples were followed and the samples were mixed thoroughly prior to analysis. A synthetic seawater wash solution and standards containing 3.2% sodium chloride (equivalent to 28 psu) were used for all samples except a small number of low salinity samples. For these samples, synthetic seawater wash solutions were prepared with lower concentrations of sodium chloride, appropriate to the salinity of the sample.

Working calibration standard solutions were calibrated against substandards prepared from certified Sagami nutrient standards. The calibration standards were prepared fresh every one or two days and run at the beginning and end of each day, as well as after every 30 - 35 samples.

Concentrations of calibration standards used (in μg-at.L^{-1}) were:

NO_2+NO_3	PO_4	SiO_2
1.0	0.1	1.0
5.0	0.5	5.0
10.0	1.5	20.0
20.0	3.0	40.0
40.0	4.0	60.0

Turbidity samples were run on the orthophosphate channel (no reagents) for samples that were obviously turbid or of low salinity and sample concentrations were corrected accordingly.

The range of the method for nitrate plus nitrite is 0.1 to 140μg-at.L^{-1}, with a stated precision of $\pm$0.19 at the 17μg-at.L^{-1} level (standard deviation of four replicates). For orthophosphate, the range of the method is 0.01 to 16μg-at.L^{-1}, with a stated precision of $\pm$0.01 at the 1.3μg-at.L^{-1} level (standard deviation of four replicates). From a detection limit of 0.2μg-at.L^{-1} the range for reactive silicate extends to 300μg-at.L^{-1}. The stated precision of the method at the 16μg-at.L^{-1} level is - 0.14 (standard deviation of four replicates). Replicate subsamples representing at least 5% of the samples in each batch were analyzed as a check on method precision. In general, the precision of these replicates was within limits outlined for the respective methods.

7b. Direct analysis

Subsamples for nutrient analyses were removed directly from the Niskin bottle with an acid-washed syringe and gently filtered through acid-cleaned, combusted (460° C for 4 h) Whatman GF/F filters (mounted in 25 mm Millipore Swinnex® filter holders) into acid-washed polyethylene bottles. Nitrate plus nitrite, ammonium and silicate samples were analyzed immediately, while orthophosphate samples were stored frozen (-20° C) until analysis.

Nitrate plus nitrite and ammonium were determined following the procedures of Wood et al. (1967) and Slawyk and MacIsaac (1972), respectively. Silicate was determined following Armstrong *et al.* (1967), and orthophosphate according to Hager et al. (1968).

Precision (in μg-at.L^{-1}) of method B based on Technicon Industrial Methods specifications is:

	Mean	1 Std dev.	N
Ammonia	1.00	0.06	10
Nitrate	5.00	0.06	10
Silicate	2.00	0.01	10
Phosphate	1.00	0.02	10

8. Particulate organic carbon and nitrogen

Water samples (750 - 2000mL) for particulate organic carbon (POC) and nitrogen (PON) were filtered onto precombusted (460° C, 4hr), 25 or 47mm diameter Whatman GF/F glass fiber filters. Vacuum was held at <100mm Hg during filtration and filter funnel sides were rinsed with filtered seawater just before filtration was completed. Filters were folded with the sample facing in and stored, frozen, in precombusted aluminum foil. Prior to analysis, samples were dried at 60° C for 8hr. Samples were analyzed with a Perkin-Elmer Model 240 Elemental Analyzer standardized with acetanilide for both carbon and nitrogen.

We have not determined the precision of the method ourselves. However, precision (pooled variance) is estimated by Macdonald *et al.* (1988) to be 1.5μg.L^{-1} for POC and 0.2μg.L^{-1} for PON.

Units

The following units are used for the tabulated data:

Phytoplankton abundance:	**cells.10mL^{-1}**
	(Note: abundance values are rounded to the nearest whole cell.10mL^{-1}. Where the concentration was less than 50 cells.L^{-1}, the abundance is omitted and presence is noted with an *.)
Latitude and longitude:	**degrees, minutes, tenths of minutes (north and west)**
Depth:	**m**
Temperature:	**° C**
Salinity:	**psu**
Chlorophyll:	**μg.L^{-1}**
Nitrate, phosphate, silicate:	**μg-at.L^{-1}**
Particulate organic carbon and nitrogen:	**μg.L^{-1}**

Notes on the taxonomy

A number of taxa, particularly of the genus *Chaetoceros*, were unidentified. Drawings of these and of a number of other taxa encountered are included in Waters et al. (1992).

Taxa were identified to the finest level possible by the method used. In some cases, we were not able to identify to species. Difficulty in identification of some taxa, due to small size or similarity in structure, may have resulted in inclusion of these in counts for other taxa. We have restricted this report to photoautotrophic taxa. However, many species of dinoflagellates (Pyrrophyta) may operate in both an autotrophic and a heterotrophic mode. Also, we did not distinguish all species in some genera that include both heterotrophic and autotrophic species.

Listed below are individual cases of clarification on how we handled some of these problems.

Haptophyta

Imantonia rotunda and *Dicrateria* sp.
May include *Phaeocystis* 224 unless flagellar apparatus is visible, and/or *Dicrateria inornata* up to 3.5μm. *Dicrateria* sp. is probably *D. inornata* and may include *I. rotunda*.

Corymbellus sp.
"Twins"

Chrysochromulina spp. 3 - 6μm
May include *Emiliania huxleyi* without coccoliths and *Dicrateria* spp. unless flagellar apparatus is visible

Chrysochromulina spp. 6 - 10μm
May include *Chrysidalis* spp. unless flagellar apparatus is visible

Chrysochromulina spp. 10 - 15μm
May include decalcified *Crystallolithus* unless flagellar apparatus is visible

Bacillariophyta

Leyanella arenaria and *Minutocellus scriptus*
Need transmission electron microscopy to confirm identity

Cyclotella sp. 2
This species is 4 - 10μm in diameter

Thalassiosira conferta
Occasionally may have included *Cyclotella* sp. 2 (particularly in Cruise 89-06 samples 28-3 to 30-7, 37-1/3, 37-4, 37-7, 39-3, 39-5, 47-1 and 47-7).

T. pseudonana
Needs transmission electron microscopy to confirm identity; occasionally may have included *Cyclotella* sp.2 (particularly in Cruise 87-05 samples 51-9, 54-1, 54-5 and 83-7) and/or *T. lineata* (Cruise 89-06).

Chaetoceros sp. gii
May be *C. simplex* v. *calcitrans*

Chaetoceros cinctum / C. crucifer
Only distinguishable by means of certain pairs of setae near the end of the chain

C. constrictum / C. vanheurckii
Only distinguishable in the resting spore stage

C. convolutum / C. concavicorne
Not separable with sufficient confidence for reliable counts of each

Unidentified cylinders
May be a species of *Rhizosolenia*

Nitzschia cylindroformis
Included *N. pseudonana* on occasion, in generally far lower numbers, but estimates were not possible due to the identical girdle view.

N. subfraudulenta / N. fraudulenta
N. fraudulenta was only rarely identified with absolute certainty, but was often thought to be present on the basis of its shape

N. pacifica
After Cupp (1943) (1988 data only). See Hasle (1965) for details regarding division of *N. pacifica* into *N. subfraudulenta* and *N. heimii*.

N. pungens
Includes f. *multiseries* (Forbes and Denman 1991)

N. seriata f. *obtusa*
Occasionally may include specimens of *N. subpacifica*

N. turgidula / N. turgiduloides
This may include *N. turgiduloides*. The empty frustules that were examined were all closer to *N. turgidula* and were wider (3 μm) than *N. turgiduloides*, but the length, 40 - 96 μm, was well into the range of the latter

Prasinophyta

Positive identification of *Micromonas pusilla* requires live material

Nephroselmis spp. / *Bipedinomonas* spp.
Transmission electron microscopy is often required to distinguish these taxa. *Mamiella* Moestrup is another possible contributor (recorded in Saanich Inlet, Patricia Smith, pers. comm.)

Tetraselmis spp. and *Pyramimonas* spp. are usually distinguishable, but were generally listed together

Pachysphaera spp. / *Pterosperma* spp.
These cannot be distinguished in the motile stage

Pterosperma cristatum
Counts are of phycomata (cysts).

Euglenophyta

Eutreptiella spp. usually comprises *E. marina* and especially *Eutreptiella* sp. 18 - 28μm (as in Waters et al. 1992).

Pyrrophyta

Dinophyceae spp., *Amphidinium* spp., *Cochlodinium* spp., *Gymnodinium* spp., *Gyrodinium* spp. and Peridiniaceae spp.
All may include heterotrophic species, decidedly so in cruises 79-04 to 82-02 inclusive, and 88-05 and 88-07

Gymnodinium flavum
As in Wailes (1939)

G. vitiligo / G. estuariale
May be conspecific; it was impossible to be certain whether or not *G. estuariale* was present.

Peridiniaceae spp.
These are plain, without lists and spines; cell shape cf. *Scrippsiella*, *Glenodinium danicum*, *Peridinium nudum*.
As noted above, may include heterotrophic species.

Scrippsiella sp. u (9.5 - 13.5μm)
May be heterotrophic

Cryptophyta

Hemiselmis spp.
May include *Isoselmis* spp.

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(Numbers refer to taxonomic reference number in Table 2)

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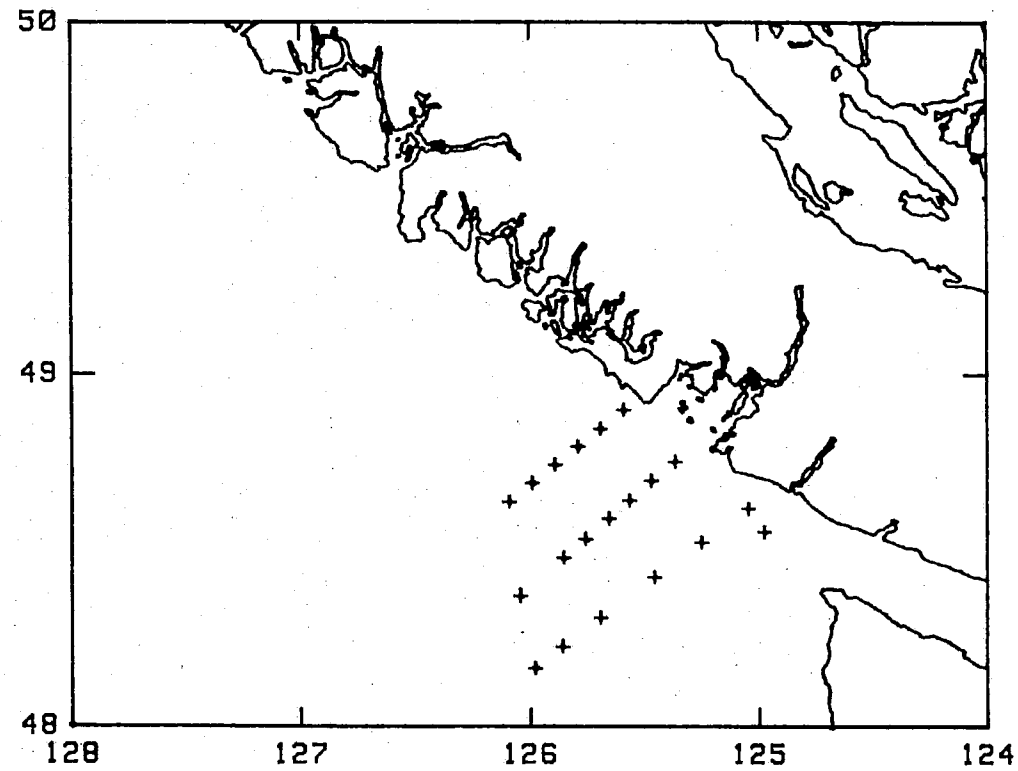
CRUISE 79–04

3 – 14 July 1979

Area of operations: Continental shelf off southwest Vancouver Island

Vessel: C.S.S. Vector



CRUISE 79–04

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
2–9	5 July 79	48 10.0	125 58.7	16.4	12.7	32.02		11.6	0.51	7.7
3–8		48 13.6	125 51.5	25.0	11.1	32.71	1.1	2.7	0.71	6.1
4–7		48 18.5	125 41.6	16.4	9.6	33.10	2.1	17.7	1.69	25.2
5–7		48 25.3	125 27.5	10.0			2.7	10.8	1.11	29.2
6–7		48 31.3	125 15.1	5.8	11.2	33.09	6.3	5.1	0.90	19.0
7–5		48 37.1	125 02.8	7.7	10.3	32.12	2.7	19.6	1.83	37.2
8–4		48 33.1	124 58.6	8.8	9.5	32.24		25.3	2.17	41.2
9–6	6 July 79	48 45.2	125 22.0	5.4	10.4	32.27	2.7	19.4	1.69	36.8
10–8		48 41.9	125 28.3	5.2	11.5	31.42	1.6	21.5	1.92	37.8
11–5		48 38.5	125 34.0	8.3	8.9	32.55	1.4	27.1	2.27	42.7
12–5		48 35.4	125 39.4	6.5	9.5	32.39	4.2	23.9	2.02	39.7
13–5		48 31.9	125 45.5	6.1	11.4		15.8	1.4	0.38	2.9
14–7		48 28.7	125 51.2	14.5	10.9	32.33	4.4	5.6	0.82	8.5
15–8		48 22.2	126 02.6	19.7	11.6	32.32	0.7	0.7	0.59	3.7
17–6	7 July 79	48 38.3	126 05.5	16.7	11.6	32.28	1.9	2.3	0.71	5.1
18–3		48 41.5	125 59.5	24.8	10.0	32.23	4.3	18.1	1.76	27.1
19–6		48 44.7	125 53.5	5.9	11.7	32.05	10.7	1.4	0.34	2.4
20–4		48 47.8	125 47.5	7.5	11.5	32.11	5.5	19.0	1.82	36.5
21–3		48 50.9	125 41.6	3.6	11.5	31.57	3.9	19.5	1.80	36.0
22–6		48 54.1	125 35.5	7.2	11.8	32.00	8.4	12.9	1.26	29.8

CRUISE 79–04

Taxon	Station 2–9	3–8	4–7	5–7	6–7	7–5	8–4	9–6	10–8
dictyocha speculum		7				14		20	14
coccolithu pelagicus								21	
detonula pumila							35	40	
leptocylin danicus			142			14			40
leptocylin mediterraneu			100						
stephanopy palmeriana							5		
skeletonem costatum					2120	341		1140	130
thalassios spp.		7	128		2933	284	49	308	123
coscinodis spp.		7				28	10	34	
eucampia zoodiacus					226				
chaetocero spp. cells						2042		60	
chaetocero spp. chains	22	41	241		10500		276	731	47
chaetocero spp. spores		28			235	43	30	154	25
bacteriast delicatula			14						
rhizosolen spp.								81	
rhizosolen setigera			3210		982	14	15		11
pennales spp. 0–20							10	7	4
pennales spp. 21–40			14			43	10	20	32
pennales spp. >40	15	159	14			71	54	87	83
asterionel glacialis						57			
thalassion nitzschoides							54	34	40
nitzschia spp.		21	100		2642	327	232	825	285
nitzschia closterium	37	986					15	34	79
nitzschia longissima	7	14	85		151	28	113	81	97
eutreptiel spp.								13	
dinophycea spp.	271	932	133	12400	6190	1270	324	1048	854

CRUISE 79–04

Taxon	Station 11–5	12–5	13–5	14–7	15–8	17–6	18–3	19–6	20–4
dictyocha speculum									20
coccolithu pelagicus							25		
centrales spp.	87			14					
detonula pumila			48	142			254		
leptocylin danicus			145	14			292	220	13
leptocylin mediterraneu			56	100			254	732	
stephanopy spp.	27			14					13
skeletonem costatum	1140	2320		810			344		1810
thalassios spp.	195	872	24	313			203	220	1120
coscinodis spp.		27							
biddulphi longicruris			16						
chaetocero spp. cells	60		16					1390	13
chaetocero spp. chains	302	510	636	2290			483	1470	422
chaetocero spp. spores	67	54	24	227			13	146	54
bacteriast delicatula			9					73	
rhizosolen spp.			16						
rhizosolen alata f.alata			8					146	
rhizosolen delicatula				57					
rhizosolen setigera	34	13	3200	43			4330	27300	
pennales spp. 0–20	27	13							7
pennales spp. 21–40	34	27	8	100		21	13	73	27
pennales spp. >40	60	80	8	18			13	73	154
asterionel glacialis							25		54
thalassion nitzschoides	87	134							
tropidonei spp.			8			7	25		
nitzschia spp.	235	604	73	484	40	36	64	366	
nitzschia closterium	47	40	8	43	685	760		73	
nitzschia longissima	47	134	24	85			110	73	101
eutreptiel spp.									74

Continued	11–5	12–5	13–5	14–7	15–8	17–6	18–3	19–6	20–4
dinophycea spp.	548	1774	147	1225	1337	1070	1364	1776	500
prorocentr spp.			16					146	
gymnodiniu spp.									7
gyrodinium spp.				28					
gonyaulax spp.			24	28	7				
ceratium spp.				14				73	

CRUISE 79–04

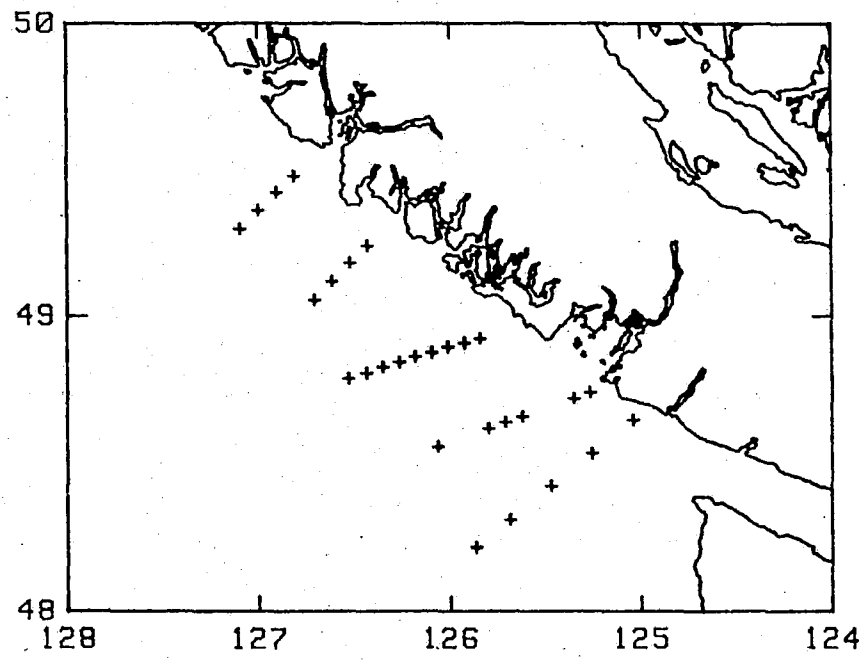
Taxon	Station 21–3	22–6
dictyocha speculum	48	54
detonula pumila		375
leptocylin mediterraneu		13
skeletonem costatum	780	1810
thalassios spp.	46	712
chaetocero spp. cells	21	
chaetocero spp. chains	242	2054
chaetocero spp. spores		40
rhizosolen setigera	34	1280
pennales spp. 0–20	14	27
pennales spp. 21–40	90	
pennales spp. >40	138	54
thalassion nitzschoides		13
nitzschia spp.	400	1033
nitzschia closterium	55	
nitzschia longissima	200	255
eutreptiel spp.		27
dinophycea spp.	755	354
prorocentr spp.		13
gonyaulax spp.	21	27

CRUISE 79–05

21 – 30 August 1979

Area of operations: Continental shelf off southwest Vancouver Island

Vesel: C.S.S. Vector



CRUISE 79–05

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
3–1	24 Aug. 79	48 33.5	126 03.8	20.8	9.8	32.63	5.2	14.4	1.61	24.6
6–4		48 37.3	125 47.9	6.2	12.1	32.16	2.0	19.1	1.69	33.9
7–4		48 38.6	125 42.6	8.5	11.0	32.57	2.3	18.9	1.54	33.0
8–8		48 39.8	125 37.3	11.0	11.2	32.41	1.9	17.5	1.50	29.4
11–7		48 43.4	125 21.3	10.3	9.8	31.97	0.6	24.5	2.22	41.5
12–4		48 44.7	125 16.1	9.9	11.1	31.74	3.0	20.7	1.89	36.4
13–4		48 39.0	125 02.5	9.2	10.7	31.80	1.7	14.4	2.02	23.0
15–6	25 Aug. 79	48 32.2	125 15.5	7.3	13.4	32.44	4.0	10.4	1.09	29.6
17–8		48 25.5	125 28.3	6.3	12.5	32.47	5.8	9.3	1.04	24.9
19–8		48 18.6	125 41.2	9.7	11.7	32.54	1.9	14.1	1.34	26.4
21–9		48 12.9	125 52.0	20.9	9.5	33.39	1.3	11.5	1.18	18.6
24–5		48 55.5	125 50.5	3.0	14.7	31.88	6.8	1.0	0.38	11.9
25–5		48 54.6	125 55.5	1.5	14.8	31.78	9.3	0.4	0.24	6.3
27–6	26 Aug. 79	48 53.8	126 00.7	1.8	14.1	32.00	12.0	0.2	0.31	9.4
29–6		48 52.7	126 05.7	10.6	32.2	11.42	11.4	1.0	0.42	11.1
31–7		48 51.9	126 10.9	6.5	16.4	31.59	1.3	0.1	0.27	3.1
33–6		48 50.8	126 15.9	28.4	10.1	32.21	1.0	6.2	0.88	12.0
35–8		48 49.8	126 21.0	17.0	12.7	32.36	0.8	2.2	0.63	9.0
36–7		48 48.5	126 26.2	31.3	11.3	32.45	0.5	3.2	0.74	10.9
37–8		48 47.4	126 31.8	35.5	13.3	32.49	0.3	0.2	0.54	6.5
39–6	27 Aug. 79	49 03.2	126 42.4	33.9	10.0	32.44	0.5	8.5	1.06	13.8
41–6		49 07.0	126 36.9	24.4	10.8	32.31	1.1	6.4	0.94	13.8
43–5		49 10.8	126 31.2	15.7	13.5	32.54	1.6	3.1	0.66	10.0
45–4		49 14.4	126 25.7	19.0			1.7	12.6	1.30	19.5
47–3		49 28.7	126 48.7	17.6	13.0	31.92	4.9	7.8	1.12	19.3
49–6		49 25.2	126 54.2	9.9	14.1	32.14	2.2	2.6	0.58	9.4
51–7		49 21.6	127 00.0	9.7	14.9	32.30	1.8	3.4	0.65	11.3
53–9		49 17.8	127 05.8	9.7	16.6	32.02	0.9	0.8	0.45	8.8
57–4	29 Aug. 79	48 54.6	125 55.5	10.5	11.9	32.17	4.0	9.3	1.22	22.6
59–5		48 53.9	126 00.7	6.9	13.5	31.69	9.2	8.6	1.11	33.3
61		48 52.7	126 05.7							
63–6		48 51.9	126 10.9	16.6	12.2	32.30	0.7	2.4	0.68	9.0
65–7		48 50.8	126 15.9	25.2	10.9	32.39	0.7	6.3	0.94	12.1
67–7		48 49.8	126 21.0	25.5	10.5	32.49	0.6	3.1	0.77	9.8
68–8		48 48.5	126 26.2	26.2	12.5	32.37	0.4	0.8	0.62	8.2

CRUISE 79–05

Taxon	Station 3–1	6–4	7–4	8–8	11–7	12–4	13–4	15–6	17–8
dictyocha speculum		5	13						
coccolithu pelagicus		1230	1110	601	258	142	687	472	486
corethron criophilum		5				28	43	57	40
leptocylin danicus	155		966					5910	8620
leptocylin mediterraneu	26								
stephanopy palmeriana	77								
skeletonem costatum	644			215					
thalassios spp.	1414	5	67			57		28	81
coscinodis spp.	52		54			28			
biddulphi aurita						14			
chaetocero spp. cells	1670	24	483		1030	866	816	28	
chaetocero spp. chains	928					241		104	
chaetocero spp. spores	232					14			
rhizosolen spp.	77								
rhizosolen setigera		5							
pennales spp. 0–20	180	14	27		43	43		14	81
pennales spp. 21–40	129	5							
pennales spp. >40	52	14	13			57	86		
thalassion nitzschoides	77								
tropidonei spp.	26					14			
nitzschia spp.	1210	521	1420	129	215	14	129	3980	1410
nitzschia closterium		19	54			142	172		
nitzschia longissima			27						
eutreptiel spp.		33						50	
dinophycea spp.	515	929	1370	1460	215	355	773	618	2510
prorocentr spp.		66							
amphidiniu spp.	26								
gymnodiniu spp.							172		40
gyrodinium spp.						57		14	
gonyaulax spp.						85		28	

CRUISE 79–05

Taxon \ Station	19–8	21–9	24–5	25–5	27–6	29–6	31–7	33–6	35–8
dictyocha speculum						17			
coccolithu pelagicus	51	129	137						228
corethron criophilum	44		28	13	57				
leptocylin danicus			171	201			77		
stephanopy spp.				27					
skeletonem costatum			426	121	28		56		
thalassios spp.			383	482	227	426	16		183
coscinodis spp.				53	114	28	8		91
eucampia zoodiacus				13	114				
chaetocero spp. cells			2690	585	810	938			
chaetocero spp. chains			284	1019	1107		69		
chaetocero spp. spores			28	13			4		
bacteriast delicatula			14	81			81		
rhizosolen spp.			426	618	100				
rhizosolen setigera						128	487		
pennales spp. 0–20				54	14	28			
pennales spp. 21–40			14		43	17			
pennales spp. >40			28	40	142	117	20		
thalassion nitzschoides				81	28	57			
tropidonei spp.			14		57	43			
nitzschia spp.	267	43	5210	10100	16000	17300	149	47	137
nitzschia closterium			28			28			
dinophycea spp.	318	859	27	731	1170		292	213	731
prorocentr spp.	13		43	81	71	17			
dinophysis spp.			14				4		
gyrodinium spp.				67	100		28		
gonyaulax spp.			28	27	114	128	4		
ceratium spp.			99	66	43	17	141		

CRUISE 79–05

Taxon	Station 36–7	37–8	39–6	41–6	43–5	45–4	47–3	49–6	51–7
dictyocha speculum						44	13	46	44
coccolithu pelagicus	91	183		365	91	89		365	222
leptocylin danicus							127	91	
stephanopy palmeriana							25		
skeletonem costatum							51		
thalassios spp.	137	46	46	183			242		
coscinodis spp.							13		
chaetocero spp. chains							1787		
rhizosolen setigera							204		
pennales spp. 0–20			91						
pennales spp. 21–40			46				64		
pennales spp. >40							25		
nitzschia spp.	91		91			133	344	137	44
dinophycea spp.	685	183	1004	1506	959	3350	141	3200	664
cochlodini spp.					46				44
gymnodiniu spp.				46					

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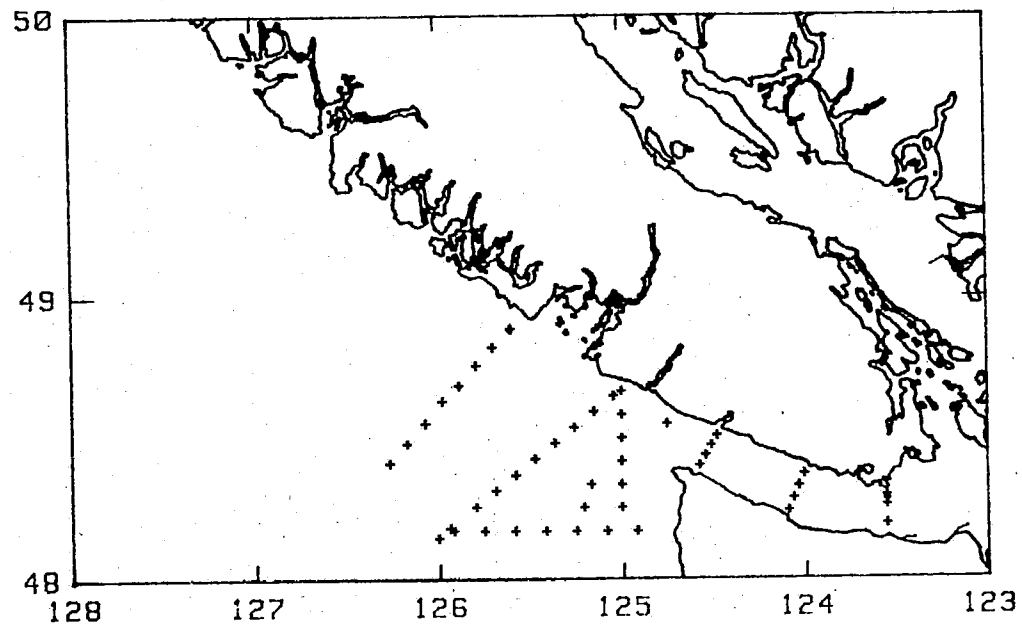
Taxon	Station 53–9	57–4	59–5	61	63–6	65–7	67–7	68–8
coccolithu pelagicus	103	14	7200	1330	273	86	210	215
corethron criophilum				24				
skeletonem costatum		114						
thalassios spp.		299	1736	97	326	129	111	129
coscinodis spp.			218					
eucampia spp.		28						
chaetocero spp. cells		355	1300					
chaetocero spp. chains		142						
rhizosolen spp.		142						
rhizosolen stolterfothi		213						
pennales spp. 0–20		43						
pennales spp. 21–40		28		72				
pennales spp. >40		128		48		43	22	
thalassion nitzschoides		28						
tropidonei spp.		14						
nitzschia spp.		4405		19700	54	129	66	
nitzschia closterium		14	1090					172
nitzschia longissima		28		48				
eutreptiel spp.			436					
dinophycea spp.	335	336	5450	1943	708	1460	664	472
prorocentr spp.			1090					
dinophysis spp.		14						
cochlodini spp.								43
gyrodinium spp.			654	24	164	129	44	
gonyaulax spp.							44	
ceratium spp.		71						

CRUISE 80–05

2 – 8 June 1980

Area of operations: Continental shelf off southwest Vancouver Island

Vesel: C.S.S. Vector



CRUISE 80–05

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
1–6	2 June 80	48 17.4	123 33.0	9.3	8.6	31.93	0.7	27.2	2.37	44.5
2–6		48 15.4	123 33.0	13.0	9.4	31.31	1.0	24.6	2.14	40.4
4–6		48 11.4	123 33.0	6.2	9.2	31.86	0.8	26.4	2.21	42.7
5–7	3 June 80	48 14.3	124 05.2	13.5	9.3	31.67	1.5	24.8	2.13	41.4
6–8		48 17.0	124 03.5	14.0	8.9	31.75	1.0	26.3	2.19	43.1
7–9		48 19.6	124 01.8	11.2	9.3	31.65	1.6	25.2	2.34	42.0
8–6		48 22.2	124 00.0	10.5	9.1	31.72	1.1	26.1	2.17	42.9
9–7		48 30.5	124 28.6	4.5	9.8	31.80	4.5	22.1	1.89	38.8
10–9		48 28.4	124 30.5	11.1	9.7	31.66	2.8			
11–10		48 26.2	124 32.4	7.5	9.4	31.63	1.7	24.5	2.03	36.6
12–6		48 24.0	124 34.4	12.4	9.4	31.65	2.4	24.7	2.03	41.0
13–7		48 33.0	124 45.0	12.2	10.0	31.46		21.3	1.77	37.1
14–5	4 June 80	48 39.0	125 02.5	5.8	10.4	31.48	4.2	21.1	1.62	38.0
15–7		48 35.6	125 09.0	4.8	9.4	31.91	3.2	23.9	1.97	40.0
16–7		48 32.2	125 15.5	5.0	10.0	32.02	5.0	17.2	1.45	32.5
17–9		48 28.9	125 21.8	3.4	10.6	31.59	17.8	2.9	0.57	20.1
18–8		48 25.5	125 28.3	3.2	11.1	31.64	16.0	2.2	0.36	10.0
19–8		48 22.0	125 34.7	2.2	10.4	31.75	21.6	5.4	0.60	19.1
20–8		48 18.6	125 41.2	2.7	10.7	31.74	10.5	0.1	0.30	6.9
21–9		48 15.1	125 47.7	5.1	11.0	32.02	0.9	1.8	0.57	8.5
23–9		48 10.6	125 56.2	18.8	10.0	32.16	1.3	3.4	0.86	13.3
24–10		48 08.5	126 00.0	7.8	10.3	32.19	2.8	1.7	0.66	12.9
25–10	5 June 80	48 24.6	126 15.8	13.1	10.4	32.02	2.0	1.1	0.55	12.2
27–9		48 28.8	126 10.0	16.3	10.4	32.07	4.4	1.3	0.60	8.7
29–8		48 33.1	126 04.1	3.9	11.0	31.97	8.2	1.9	0.70	18.6
31–7		48 37.9	125 58.5	1.1	11.5	31.90	6.7	0.0	0.58	16.9
33–6		48 41.2	125 53.0	3.5	11.4	31.81	1.8	3.3	0.72	16.2
35–6		48 45.4	125 47.4	1.6	11.7	31.70	5.4	2.3	0.73	17.9
37–5		48 49.2	125 42.0	2.2	10.7	31.77	2.8	13.2	1.38	26.5
39–5		48 53.1	125 36.1	3.1	10.1	31.78	19.3	9.5	1.02	24.4
40	6 June 80	48 10.0	124 55.0							
42–9		48 10.0	125 05.0	21.3	10.1	31.67	8.5	10.9	1.13	19.6
44–9		48 10.0	125 15.0	8.7	10.7	31.69	13.6	8.4	0.94	17.8
46–7		48 10.0	125 25.0	2.7	11.0	31.69		0.9	0.43	14.3
48–7		48 10.0	125 35.0	13.9	10.4	31.98	1.5	6.6	0.90	10.6

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
50–9	6 June 80	48 10.0	125 45.0	21.8	10.4	32.13	1.4	2.2	0.62	9.5
52–9		48 10.0	125 55.0	8.7	10.3	32.07	2.7	1.7	0.65	11.1
53–9	7 June 80	48 20.0	125 10.0	4.6	10.9	32.19	3.7	11.3	1.11	27.3
54–9		48 15.0	125 12.5	5.1	11.7	31.74	12.2	0.7	0.40	4.2
55–9		48 15.0	125 00.0	5.8	11.3	31.41	4.1	8.6	0.90	19.0
56–9		48 20.0	125 00.0	4.9	11.1	31.69	4.1	15.0	1.42	31.7
57–10		48 25.0	125 00.0	7.3	10.8	31.78	2.2	14.0	1.36	27.3
58–5		48 30.0	125 00.0	11.7	9.0	32.03	1.2	26.3	2.16	41.6
59–5		48 35.0	125 00.0	5.4	9.9	31.74	4.6	19.0	1.66	35.4
60–4		48 40.0	125 00.0	2.2	10.0	31.71	6.0	21.1	1.74	38.7

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Taxon	Station 1–6	2–6	4–6	5–7	6–8	7–9	8–6	9–7	10–9
dictyocha speculum		1	1			6		9	23
apedinella spinifera		21	12	73	2		16	236	
imantonia rotunda		2166	372	3444	9325		8493	3496	
corymbellu aureus				13					
centrales spp.	2								
leyanella arenaria								1353	
corethron criophilum		1	1					9	
leptocylin danicus	3				1		2		46
paralia sulcata	35				1		20	27	
skeletonem costatum	110	14	102	75	52	303	10	50	23
thalassios spp.	7	1			1	13		36	391
thalassios aestivalis		1	1	4	1		2	127	
thalassios anguste–line			1						
thalassios conferta		7	15	18	20		15	32	
thalassios leptopus					2				
thalassios nordenskiold		2	2	5	1		4	54	12
thalassios pacifica		3	2	7	5		11	1226	
thalassios pseudonana		2018	2006	13000	2166		9918	13710	
thalassios rotula	8	5	*		2		3	9	
lauderia borealis	34								
cerataulin pelagica		4	*						
chaetocero spp. cells	2					26			92
chaetocero spp. chains						26			403
chaetocero sp.gi		2	1	10	29		32		
chaetocero cinctum /crucifer		2	2	10	2		6	1003	
chaetocero compressum		1						73	
chaetocero debile	9	1	1	14	2		9	1276	
chaetocero decipiens	3								
chaetocero radicans								191	
chaetocero simile		1	2					54	
chaetocero subtile		1		8	10				
rhizosolen spp.						6			
rhizosolen alata f.gracillima		1	1	3	2		7		
rhizosolen delicatula			4						
rhizosolen fragilissima	1	2							

Continued	1–6	2–6	4–6	5–7	6–8	7–9	8–6	9–7	10–9
rhizosolen stolterfothi	1								
pennales spp. 0–20	4					6			23
pennales spp. 21–40	1								12
asterionel glacialis		2							
thalassion bacillaris		1	*	4	3		5	5	
thalassion nitzschoides	38	78	2	28	104	155	68	27	184
nitzschia americana		2			2		8		
nitzschia closterium	10	19	4	46	7	39	8	23	138
nitzschia cylindroform					2		21		
nitzschia delicatissim	5	15	2	53	20	32	17	54	12
nitzschia granii v.curvata		4	*	7	1		2		
nitzschia lineola		1			1			5	
nitzschia longissima		30	1	51	23		11	27	
tetraselmi spp. /pyramimonas		72	36	72	169		128	54	
euglenophy spp.						6			
eutreptiel spp.		2	1	11			1	14	
dinophycea spp.	15					264			386
prorocentr balticum		1	1	5	1		2	32	
gymnodiniu spp.		12	2	17	42		53	32	
katodinium rotundatum		17	17	112	106		545	445	
gyrodinium spp.		51	1	11	10		11	14	
peridiniac spp.		2			1		5		
heterocaps triquetra							1		
gonyaulax spp.							1		
heterosigm akashiwo		69	10	22	312		78	32	
cryptomona spp. 5–10		1120	218	1510	801	251	840	731	1981
cryptomona spp. 11–20	513	564	13	70	812	277	474	608	2319
mesodinium rubrum		1						59	

CRUISE 80–05

Taxon	Station 11–10	12–6	13–7	14–5	15–7	16–7	17–9	18–8	19–8
ochromonas spp.			2464	5985	1344				
dictyocha speculum	2	9	5		9	81	9	163	14
apedinella spinifera	7	346	106	115	775		268		
imantonia rotunda	880	6156	10660	12880	10720		17670		1162
leyanella arenaria			8835						
corethron criophilum		2	1		14			163	
detonula pumila							36	1	
leptocylin danicus						725			18
paralia sulcata									18
skeletonem costatum	12	10	19		135	483	1752	2933	3105
thalassios spp.	6	2	60			725	218	1955	82
thalassios aestivalis	1	1	5		4		422	652	286
thalassios anguste–line			4		3		27		9
thalassios conferta	7	12	87	27	15		1389		68
thalassios constricta								1	
thalassios leptopus		7							
thalassios nordenskiold	8	8	14		14		1893	652	1071
thalassios pacifica	4	80	152	202	30		2288		690
thalassios pseudonana	27820	15390	40580	54720	33290		45550		
thalassios rotula		5	3		6	242	91	1	123
lauderia borealis								1	27
biddulphi longicruris							18		
eucampia zoodiacus								1	64
cerataulin pelagica					3		18		9
ditylum brightwellii									9
chaetocero spp. chains						2496		20690	
chaetocero sp.gi	6	8	82		8				
chaetocero affine								3258	

Continued	11–10	12–6	13–7	14–5	15–7	16–7	17–9	18–8	19–8
chaetocero cinctum /crucifer	9	7	202	32	46		25510		395
chaetocero compressum	45	18	15		72			1	686
chaetocero constrictum /vanheurckii							708		1970
chaetocero debile	33	36	384		86		27380	19710	8544
chaetocero decipiens								1	
chaetocero didymum								1	
chaetocero filiforme									999
chaetocero radicans	8	7	9		6				481
chaetocero septentriona									254
chaetocero simile	12	20	6	4	7		795		282
chaetocero sociale					328	2577	4585	100000	65560
bacteriast delicatula								977	9
rhizosolen alata f.gracillima									9
rhizosolen delicatula							9	163	27
rhizosolen fragilissima								1	27
rhizosolen stolterfothi								2281	309
asterionel glacialis							127	1	18
thalassion bacillaris	3	6	2	4					
thalassion nitzschoides	82	206	157		171	644	327	815	91
grammatoph spp.						81			
pleurosigm acutum									9
nitzschia americana				3	10		82		726
nitzschia bicapitata			18						
nitzschia closterium	32	6	2		5	161	64	1	
nitzschia delicatissim	35	76	6		81	322	490		68
nitzschia granii v.curvata	6	4	2	5	5		73		
nitzschia lineola	5	3			3		54		9
nitzschia longissima	28	81	16		72		263		64
nitzschia seriata	4	2	5		4	242	132	2281	236
nitzschia subpacifica							41		14
tetraselmi spp. /pyramimonas	105	2072	880	1220	1360		3042		27

Continued	11–10	12–6	13–7	14–5	15–7	16–7	17–9	18–8	19–8
eutreptiel spp.		45	44		18		154		18
dinophycea spp.						886			
prorocentr balticum	4	10	22		13		45		
gymnodiniu spp.	51	262	130		121		236		18
katodinium rotundatum	581	5488	4717	5348	4144		726		
gyrodinium spp.	12	58	36		15		5539		23
peridiniac spp.			76	12	41		27		
heterocaps triquetra			2				9		9
gonyaulax spp.							14		
ceratium spp.								1	
heterosigm akashiwo	24	444	184	720	575				
cryptomona spp. 5–10	4536	1638	3836		1680		1253	725	
cryptomona spp. 11–20	52	3220	4844		4284		4177		363
mesodinium rubrum	3		110				45		

CRUISE 80–05

Taxon \ Station	20–8	21–9	23–9	24–10	25–10	27–9	29–8	31–7	33–6
ochromonas spp.		860		3836	1350		10680		560
dictyocha speculum					4	13	86	40	16
imantonia rotunda		9177		58600	17100		200800		8322
leyanella arenaria		421		51410	1180		136600		76840
corethron criophilum	33								
leptocylin danicus	1								
skeletonem costatum	3519					117			
thalassios aestivalis	358								
thalassios conferta		9			264				4
thalassios nordenskiold	1629	3	24		3				1
thalassios pacifica		5			6		5		5
thalassios pseudonana		70000		101	2548		41150		507
thalassios rotula	1727								
lauderia borealis									2
eucampia zoodiacus						143			
cerataulin pelagica						104			
chaetocero spp. cells	1222								
chaetocero spp. chains	97020					169			
chaetocero sp.gi	302								
chaetocero compressum						951			24
chaetocero debile	56940								
chaetocero decipiens	163					130			
chaetocero didymum	98					26			
chaetocero filiforme							3882		
chaetocero radicans						834			
chaetocero sociale	14420								
bacteriast delicatula	1					13			3
rhizosolen delicatula	1					78			
rhizosolen fragilissima	65					1720		40	27
pennales spp. 0–20			48					886	
asterionel glacialis	228	2							
thalassion nitzschoides	65		24	8	18	26	23		10
nitzschia americana		14		10					
nitzschia bicapitata		51		304					
nitzschia closterium	163					39			

Continued	20–8	21–9	23–9	24–10	25–10	27–9	29–8	31–7	33–6
nitzschia cylindroform		30		176	216		2452		148
nitzschia delicatissim		6	24			13	5		
nitzschia seriata	684					182			
tetraselmi spp. /pyramimonas		198		6840	104		26400		7239
dinophycea spp.			72			13			
prorocentr balticum		2			5		123		
gymnodiniu spp.		8		18	103		145		15
katodinium rotundatum		27		44	860		2679		51
gyrodinium spp.		5		8	66		27		7
gonyaulax spp.	1								
ceratium spp.	1								2
heterosigm akashiwo				26	10		54		
cryptomona spp. 5–10	3442	2856	1305	30440	8721	1610	48130	8253	4116
cryptomona spp. 11–20		336	1015	324	720		91	8857	47

CRUISE 80–05

Taxon	Station 35–6	37–5	39–5	40	42–9	44–9	46–7	48–7	50–9
ochromonas spp.		325			3995	263		8379	
dictyocha speculum	43	6	70	1	54	9			
apedinella spinifera						54			
imantonia rotunda		8835			9897	3632		33400	
centrales spp.	1								
leyanella arenaria		83680							
corethron criophilum			1		9		15		
detonula pumila			1				1		
leptocylin danicus			279	1	263	18			
skeletonem costatum			15570	264		1970	1098		
thalassios spp.	2			577	64	91	647		
thalassios aestivalis			908		177	41	105		
thalassios angulata			1				1		
thalassios anguste–line			279		27		43		
thalassios conferta		12				82		18	
thalassios nordenskiold			977		468	1362	286		
thalassios pacifica		6			82	150		3	
thalassios pseudonana		5152						80	
thalassios rotula			698		36	54	135		
coscinodis spp.				82					
lauderia borealis			1				45		
eucampia zoodiacus					163	54	270		
cerataulin pelagica	4				27	45	1		
ditylum brightwellii			70						
chaetocero spp. cells			2094	132			978		
chaetocero spp. chains			5376	775			1847		
chaetocero cinctum /crucifer					1081	726			
chaetocero compressum	62	12			772	54			
chaetocero constrictum /vanheurckii					327	563			
chaetocero debile			11870	49	3441	9216	3367	7	
chaetocero decipiens			209						
chaetocero diadema					136				
chaetocero didymum			559		204				
chaetocero filiforme						636			
chaetocero laciniosum						173			

Continued	35–6	37–5	39–5	40	42–9	44–9	46–7	48–7	50–9
chaetocero lorenzianum						64			
chaetocero radicans					110500	1121			
chaetocero simile					32				
chaetocero sociale			30720			45900	28840		
bacteriast delicatula	3		140			64	45		
rhizosolen spp.			70						
rhizosolen alata f.gracillima					173				
rhizosolen delicatula			1				15		
rhizosolen fragilissima	11	12			36	27	1		
rhizosolen fragilissima v.1						45			
rhizosolen stolterfothi	7		489		2025	318	451		
pennales spp. 0–20				148			150		
pennales spp. 21–40				16			15		
asterionel glacialis			140			18	30		
thalassion nitzschoides		28	279	527	104	109		4	
nitzschia americana		8			854	291		146	
nitzschia bicapitata		226						30	
nitzschia closterium			279	49			165		
nitzschia cylindroform		208							
nitzschia delicatissim				115		64	45	7	
nitzschia granii v.curvata					27	18			
nitzschia lineola					127	23			
nitzschia longissima						91			
nitzschia pungens			70						
nitzschia seriata	12		489		1099	331	226		
nitzschia subpacifica					254	36			
cylindroth fusiformis					14	9			
tetraselmi spp. /pyramimonas		182			250	123		176	
dinophycea spp.	403		242	66			207		
prorocentr spp.							30		
prorocentr balticum		2							
dinophysis spp.							45		
gymnodiniu spp.		20			218	191		20	
katodinium rotundatum		37			45			80	
gyrodinium spp.		9				36		9	
peridiniac spp.						9			
gonyaulax spp.					9				

Continued	35–6	37–5	39–5	40	42–9	44–9	46–7	48–7	50–9
ceratium spp.	1				5		30		
heterosigm akashiwo								14	
cryptomona spp. 5–10	5837	7068	1932	791		145	207	4452	2271
cryptomona spp. 11–20	2013	58		280		390	1932	148	
mesodinium rubrum					23				

CRUISE 80–05

Taxon	Station 52–9	53–9	54–9	55–9	56–9	57–10	58–5	59–5	60–4
ochromonas spp.	3876		23810	6401	2576		1180		6384
dictyocha speculum		1	54		3	8			10
apedinella spinifera					495		52	54	452
imantonia rotunda	36820		45290	45290	11970		10940	16400	22120
leyanella arenaria	33290				1204		2632	39330	48790
corethron criophilum		49	14		5	23		9	12
leptocylin danicus		1	18			70			
skeletonem costatum		137	73	658	346		28	145	20
thalassios spp.		147	27			164	2	499	76
thalassios aestivalis		29						54	85
thalassios anguste–line								9	
thalassios conferta			27	41	7		3	204	141
thalassios decipiens						8			
thalassios nordenskiold		78	18	59	28	23	6	173	204
thalassios pacifica			68	41	66		16	390	1400
thalassios pseudonana	18920				59960		47420	19670	56090
thalassios rotula		215	9			8		27	18
lauderia borealis			14		5				
eucampia zoodiacus		10	336		5				
cerataulin pelagica			64						
chaetocero spp. chains		3902				790			
chaetocero sp.gi							20	59	550
chaetocero cinctum /crucifer			590	91				390	
chaetocero compressum			908	468	18				212
chaetocero constrictum /vanheurckii			114	73					
chaetocero debile		274	2388		37	414		881	2045
chaetocero didymum			109	36					
chaetocero filiforme			54		455				
chaetocero radicans				145					
chaetocero septentriona			118						
chaetocero sociale		303	93160	3414		860			401
bacteriast delicatula		10	127	100		8			
rhizosolen alata f.gracillima			109		3				
rhizosolen delicatula			18			1			
rhizosolen fragilissima		1	145	18	19	31			2

Continued	52–9	53–9	54–9	55–9	56–9	57–10	58–5	59–5	60–4
rhizosolen setigera					2				
rhizosolen stolterfothi			3278	241	14	16			
pennales spp. 0–20						63			
asterionel glacialis									4
thalassion nitzschoides		20	45	41	73	55	129	145	206
gyrosigma spp. pleurosigma						8			
nitzschia americana			1825	141	16		24		21
nitzschia bicapitata					240				
nitzschia closterium		29			10	23	32	5	13
nitzschia cylindroform			400	159					
nitzschia delicatissim		186	127	18	84	23	35	154	244
nitzschia granii v.curvata							7	18	77
nitzschia lineola			23	9				9	
nitzschia longissima			36	59	24		49	50	46
nitzschia seriata		39	1489	150	27	55	10	14	21
nitzschia subfraudulen /fraudulen			50						
nitzschia subpacifica			136						
tetraselmi spp. /pyramimonas	218		6220	2070	264		172	100	1070
euglenophy spp.		242							
eutreptiel spp.				59	19		6		40
dinophycea spp.		161							
prorocentr balticum								27	12
gymnodiniu spp.			54	41	198		258	136	68
katodinium rotundatum	152				1850		21	1367	1790
gyrodinium spp.				59	66		22		14
peridiniac spp.									10
ceratium spp.			5						
heterosigm akashiwo				18	560			95	212
cryptomona spp. 5–10	15390	12000	127	10350	6776	2029	790	440	7467
cryptomona spp. 11–20	224		409	159	1330	193	55	400	5700

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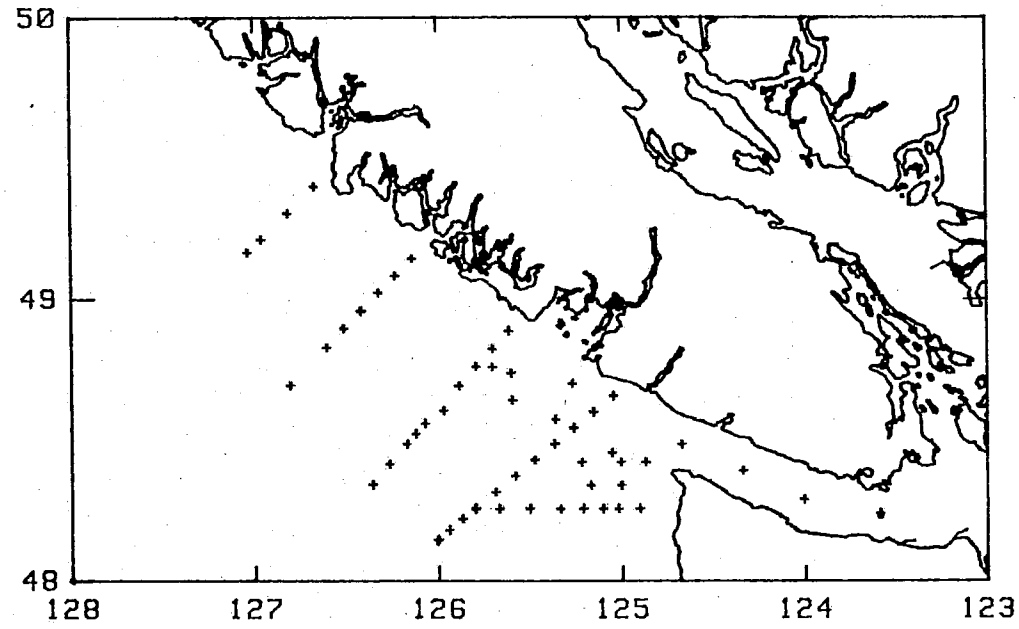
CRUISE 80–08

28 July – 8 August 1990

Area of operations: Continental shelf off southwest Vancouver Island

Vessel: C.S.S. Vector



CRUISE 80–08

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
1–8	29 July 80	48 14.0	123 35.0	6.7	10.4	31.50	7.2	17.8	1.80	33.7
2–9		48 17.0	124 00.0	4.6	11.0	31.59	5.1	17.3	1.64	29.4
3–9		48 23.2	124 20.0	2.7	11.4	31.28	26.8	4.9	0.93	13.5
4–9		48 28.8	124 40.0	6.4	10.8	31.32	14.6	12.4	1.32	22.6
5–1	30 July 80	48 08.5	126 00.0	20.5	10.2	32.35	0.6	39.5	1.17	13.5
6–1		48 10.6	125 56.2	12.7	11.2	32.21	3.6	2.4	0.62	8.2
7–1		48 12.9	125 52.0	11.0	12.5	31.81	6.3	2.4	0.65	11.2
8–1		48 15.1	125 47.7	15.0	13.1	31.87	8.6	0.2	0.46	4.7
9–1		48 15.1	125 47.7	10.7	13.3	31.76	3.7	1.5	0.57	11.2
11–6		48 25.5	125 28.3	9.0	11.2	31.60		9.9	1.15	20.5
12–8		48 28.9	125 21.8	3.4	11.6	31.85	28.3	1.9	0.75	12.1
13–7		48 32.2	125 15.5	2.6	11.9	31.88	15.3	2.5	0.81	14.5
14–7		48 35.6	125 09.0	5.1	11.0	31.45	25.2	9.5	1.16	20.1
15–5		48 39.0	125 02.5	4.1	11.5	31.29	14.8	10.5	1.23	20.4
16–10	31 July 80	48 15.0	125 40.0	5.0	13.4	31.89	4.0	0.2	0.38	4.5
17–7		48 15.0	125 30.0	10.6	12.3	31.71	1.4	9.4	1.13	17.7
18–6		48 15.0	125 20.0	7.4	11.9	31.53	14.2	7.3	1.01	19.8
19–9		48 15.0	125 12.5	10.8	10.7	32.32	3.8	13.2	1.36	24.1
20–7		48 15.0	125 06.0	5.4	11.9	32.41	1.7	11.3	1.15	31.2
21–10		48 15.0	125 01.0	3.8	11.8	32.35	2.0	11.8	1.28	31.3
22–8		48 15.0	124 54.0	6.3	11.5	32.38	1.9	11.6	1.29	28.9
23–8		48 20.0	125 00.0	8.7	11.7	32.47	1.2	9.1	1.03	26.2
24–8		48 20.0	125 10.0	6.1	12.8	32.08	16.5	2.9	0.71	10.1
25–8		48 25.0	125 13.0	7.5	11.3	32.26	23.2	7.5	0.95	15.3
26–9		48 27.0	125 03.0	2.7	11.2	32.30	15.6	9.5	1.16	21.5
27–9		48 25.0	125 00.0	11.2	9.9	32.71	0.9	13.7	1.70	35.9
28–10		48 25.0	124 52.0	5.0	11.5	32.40	1.2	13.8	1.34	27.3
29–4	1 Aug. 80	48 53.1	125 36.7	10.8	11.4	32.06	29.1	5.6	1.00	11.2
31–5		48 49.2	125 42.0	2.4	12.2	31.78	27.3	0.8	0.66	8.2
33–5		48 45.4	125 47.4	8.3	12.1	31.95	22.5	0.6	0.66	3.6
35–5		48 41.2	125 53.0	10.6	12.7	31.77	8.3	1.3	0.73	9.3
37–6		48 35.9	125 58.0	10.9	11.4	31.82	11.8	10.7	1.48	19.5
39–7		48 33.1	126 04.1	14.7	9.5	32.47	0.8	14.0	1.50	21.3
40–1		48 31.0	126 07.1	9.7	12.2	32.10	3.1			
41–9		48 28.8	126 10.0	6.6	12.0	32.04	8.8	0.2	0.53	1.6

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
43–9	1 Aug. 80	48 24.6	126 15.8	12.9	11.7	32.11	20.7	0.5	0.78	6.0
45–9		48 20.2	126 21.3	20.6	11.9	32.19	20.2	0.6	0.77	4.6
46–8	2 Aug. 80	48 41.3	126 48.1	26.0	12.3	32.01	6.9	0.9	0.66	2.3
48–8		48 45.3	125 42.1	24.0	11.9	32.17	14.9	3.5	0.95	5.3
50–9		48 49.5	126 36.2	9.8	12.2	32.09	13.5	2.3	0.68	6.1
52–7		48 53.6	126 30.5	16.2	10.7	32.61	1.7	8.9	1.28	12.6
54A–9		48 57.4	126 25.0	8.7	11.4	32.15	33.6	0.4	0.81	6.3
54A–9		48 57.4	126 25.0	8.7	11.4	32.15	33.6	0.4	0.81	6.3
56–7		49 01.3	126 19.3	10.2	11.3	32.05	14.6	6.4	1.07	9.0
58–4		49 05.0	126 13.8	8.4	12.3	31.92	19.3	0.2	0.66	3.7
60–4		49 08.7	126 08.2	12.2	11.3	31.87	21.1	6.1	1.12	14.7
61–3	4 Aug. 80	49 24.0	126 40.0	8.9	11.4	32.16	11.4	9.9	1.24	20.7
63–7		49 18.3	126 48.8	12.3	11.8	32.03	21.4	1.4	0.79	8.3
65–8		49 12.8	126 57.5	11.1	12.1	32.16	15.0	1.2	0.66	5.5
66–9		49 10.0	127 02.0	20.1	11.0	32.27	4.0	8.3	1.14	20.5
67–6	5 Aug. 80	48 38.1	125 35.6	10.1	10.1	31.75	30.3	7.6	1.10	13.0
68–8		48 44.0	125 36.0	10.4	11.1	31.58	12.0	15.0	1.50	28.8
69–6		48 41.7	125 16.0	9.1	10.0	31.87	13.7	17.4	1.70	27.9
70–6		48 34.0	125 21.5	10.1	10.0	32.59	2.8	19.3	1.76	31.7
71–10	6 Aug. 80	48 08.5	126 00.0	9.6	13.8	32.00	0.9	0.2	0.47	11.1
73–9		48 12.9	125 52.0	23.6	12.3	32.21	1.6	1.5	0.69	6.5
74–9		48 15.1	125 47.7	4.0	12.8	31.61	10.2	0.1	0.42	3.0
75–7		48 18.6	125 41.2	13.8	11.2	32.06	36.9	2.8	0.87	6.4
76–8		48 22.0	125 34.7	4.6	11.4	31.79	3.3	19.9	1.82	33.5
77–7		48 25.5	125 28.3	5.2	11.0	32.02	8.2	1.9	0.52	3.4
78–7		48 28.9	125 21.8	8.3	10.9	32.43	4.2	14.1	1.44	20.6
79–7		48 32.2	125 15.5	8.6	11.2	32.37	2.5	14.5	1.43	28.1
80–7		48 35.6	125 09.0	9.4	10.2	32.28	2.1	23.1	2.03	36.4
81–4		48 39.0	125 02.5	9.0	9.9	31.97	3.4	20.2	1.80	31.8

CRUISE 80–08

Taxon	Station 1–8	2–9	3–9	4–9	5–1	6–1	7–1	8–1	9–1
ochromonas spp.			259						
apedinella spinifera		8	14				68	20	16
imantonia rotunda	2800	300	7264	1099	1430	2588	5176	6156	9576
corymbelu aureus			18						
corethron criophilum		7	27	23		9	14	17	8
detonula pumila	10								
leptocylin danicus	42	8	18	91		577	695	134	152
leptocylin minimus				77					
leptocylin mediterraneu									10
paralia sulcata				73					
stephanopy palmeriana		4					5	6	
skeletonem costatum	5802	4616	18670	20430	8	186	1961	554	132
thalassios spp.		11	127			9	36	27	
thalassios aestivalis	8	2	54				50	14	64
thalassios binata			18						
thalassios conferta	14	23	145			586	309	160	
thalassios leptopus						18	9		
thalassios lineata			36						
thalassios nordenskiold	166	44	363	45	6	136	872	86	5
thalassios pacifica	270	330	1217	354		844	758	800	215
thalassios rotula	290	137	835	835		36	636	232	32
coscinodis spp.								3	
lauderia borealis			54	27		14	27	8	
asterompha sp.1							14	2	
biddulphi longicruris		2							
eucampia zoodiacus		15	73	23		82	73		
cerataulin pelagica			18	32			5		
ditylum brightwellii	4	28	36			9	14	5	3
chaetocero boreale		4	91			23	50		
chaetocero cinctum /crucifer								20260	
chaetocero compressum	2010	462	3523	5021		191	1253	25780	991
chaetocero convolutum /concavicorn	8	6	32	18	5	14	14	28	
chaetocero constrictum /vanheurckii		281	227			82	32	186	58
chaetocero debile	116	4220	16120	4095		953	1625	24240	42
chaetocero diadema	886	45	195	645		54	68	613	30

Continued	1–8	2–9	3–9	4–9	5–1	6–1	7–1	8–1	9–1
chaetocero didymum				73				146	
chaetocero filiforme	52	21	82	36		54	50	22	
chaetocero laciniosum	10	75	95	54	2	59	990	140	12
chaetocero lorenzianum	18	18	54	23		45	77	842	5
chaetocero pseudocrinit	3002	75	245	436					
chaetocero radicans	806	475	1367	1112		204	73	162	
chaetocero septentriona	14	15	91	48		50	32		
chaetocero simile	186	156	509	663		363	672	510	32
chaetocero simplex								86	
chaetocero sociale	204	35	168	236		4095	32		
chaetocero subtile		12		27					
rhizosolen alata f.gracillima					11		9	5	
rhizosolen delicatula							14		
rhizosolen fragilissima			9	9			14		
rhizosolen fragilissima v.1				32		163	817	33	136
rhizosolen setigera							9		
rhizosolen stolterfothi	8	15	18				18	11	
asterionel glacialis	186	228	1090	522				16	
thalassion bacillaris		15	54					5	9
thalassion nitzschoides	86	106	163	54	2	100	168	96	28
pleurosigm acutum			14	9		9	5	2	
tropidonei lepidoptera							5		
amphora spp.			9						
nitzschia americana	404	300	1816	726		209	173	230	
nitzschia closterium		68	127	27	1	68		52	8
nitzschia closterium v.striatula					2				
nitzschia cylindroform					378			406	
nitzschia delicatissim	8	175	527		7	595	309	2630	28
nitzschia granii v.curvata						18		48	
nitzschia lineola	184	7	73	309	24	100	141		18
nitzschia longissima	14	45	54	236	2	50	195	304	20
nitzschia pseudodelica			18						
nitzschia pungens	16	23	54	136			14		
nitzschia seriata		6	186	27	2		1135	8	8
nitzschia subpacifica	22					1934	159	62	71
cylindroth fusiformis		6							
tetraselmi spp. /pyramimonas	12	15	32			104	91	48	210

Continued	1–8	2–9	3–9	4–9	5–1	6–1	7–1	8–1	9–1
pterosperm spp. /pachysphaer									47
eutreptiel spp.					12	32			6
prorocentr balticum		6	32			23	77	15	27
prorocentr gracile						68	277	56	87
dinophysis spp.								1	
gymnodiniu spp.	58	5	18	48	225	118	32	120	94
katodinium rotundatum		6	23			59	64	65	271
gyrodinium spp.		4		23	76	295		82	35
peridiniac spp.	10	7	36	23		114	45	20	156
heterocaps triquetra									3
gonyaulax spp.			5						
ceratium spp.							9		
heterosigm akashiwo			18			54			12
cryptomona spp. 5–10	384	36	390	295	406	309	2388	3556	3472
cryptomona spp. 11–20	96	61	163	186	130	1003	1308	925	4200
mesodinium rubrum							14		

CRUISE 80–08

Taxon	Station 11–6	12–8	13–7	14–7	15–5	16–10	17–7	18–6	19–9
ochromonas spp.						8436	590	1525	700
dictyocha speculum			9	14				9	
apedinella spinifera		50	41	23			38	123	
imantonia rotunda	9280	840	15510	8853	6401	9291	1190	10760	2548
corymbellu aureus						35			
corethron criophilum	82	9	9	23	14			32	4
detonula pumila		36				160			
leptocylin danicus	18	45	36	82	27	9	92	41	5
leptocylin minimus						5	2		
leptocylin mediterraneu		18				6			
stephanopy palmeriana	36		18	36			4	9	1
skeletonem costatum	26560	47760	25470	12390	35680		32	20510	6030
thalassios spp.	54		23					73	
thalassios aestivalis	45	45	36					23	
thalassios conferta	1525	499	286	409	522	95	177	1235	68
thalassios eccentrica /symmetrica			23						
thalassios leptopus			9						
thalassios nordenskiold	1126	617	363	386	536	31	10	331	8
thalassios pacifica	2334	2315	1017	1780	953	406	130	1503	462
thalassios pseudonana								8399	
thalassios rotula	1707	1880	1189	1235	863	24	7	1112	75
coscinodis spp.				9		1			
lauderia borealis	32	36	36	14			5	9	
biddulphi longicruris				9				9	
eucampia zoodiacus	36		45	23			29	64	
cerataulin pelagica			14			8			
ditylum brightwellii	64	27	36	118	32		6	36	
chaetocero sp.gi	136								
chaetocero boreale	36		64	23				36	

Continued	11–6	12–8	13–7	14–7	15–5	16–10	17–7	18–6	19–9
chaetocero diadema	209	3859	232	817	872	12		27	
chaetocero didymum			100		36				2
chaetocero filiforme	282	127	68	54	45		152	563	
chaetocero laciniosum	227	173	159	726	50	24		136	12
chaetocero lorenzianum	73	100	54	254	68	32	10	127	2
chaetocero pseudocrinit	254	2733	1471	395	2933		1190	917	
chaetocero radicans	953	3623	445	7527	4776			191	16
chaetocero septentriona	218	318	68	45	54		56	27	
chaetocero simile	73	440	295	872	463	34		163	30
chaetocero sociale				1961				54	
chaetocero subtile								27	
bacteriast delicatula							6		
rhizosolen alata f.gracillima							4		
rhizosolen delicatula				23			8		
rhizosolen fragilissima	27			23			4		
rhizosolen fragilissima v.1	45	54	77	127		43	113	50	21
rhizosolen stolterfothi		23		32		8	4	9	
asterionel glacialis	935	599	858	840	1407	12	12	409	171
thalassion bacillaris	18	14	14	14	32	5	4	27	8
thalassion nitzschoides	182	54	223	318	159	22	50	291	66
pleurosigm acutum		9						9	
amphora spp.							4		
nitzschia americana	1298	3859	3541	1371	2633		142	1389	238
nitzschia bicapitata				27				50	
nitzschia closterium	45	36	95	59	73		20	109	31
nitzschia cylindroform			136				230	254	2212
nitzschia delicatissim	1380	73	1121	953	1235	1310	38	2107	240
nitzschia granii v.curvata						10			
nitzschia lineola	27	395	45		45	135	13	45	28
nitzschia longissima	295	282	168	95	95	186	67	77	12
nitzschia pungens	41	45	36	54		5			
nitzschia seriata	54		154	136				54	
nitzschia subfraudulen /fraudulen									62
nitzschia subpacifica	345	186	64	114	36	145	356	64	8
cylindroth fusiformis							3		
tetraselmi spp. /pyramimonas	23	68	41	77	27		18	91	
pterosperm spp. /pachysphaer					18				

Continued	11–6	12–8	13–7	14–7	15–5	16–10	17–7	18–6	19–9
eutreptiel spp.		32				7			1
prorocentr balticum	36	18	14			8		27	
prorocentr gracile	9								
gymnodiniu spp.	23	54	95	82	45	20	60	27	62
katodinium rotundatum	123	104			82		47	23	130
gyrodinium spp.	64		27	18	18	6	163	18	14
peridiniac spp.	27	36	18				5	36	7
gonyaulax spp.						4			
ceratium spp.						1	1		
heterosigm akashiwo			14			5		68	
cryptomona spp. 5–10	3950	1162	1326	2097	1022	247	1680	2043	2856
cryptomona spp. 11–20	1471	976	1162	1489	54	45	176	1153	1150
mesodinium rubrum			68					41	

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Taxon	Station 20–7	21–10	22–8	23–8	24–8	25–8	26–9	27–9	28–10
ochromonas spp.			152				282		
apedinella spinifera		5	9						
imantonia rotunda	1800	1850	840	5928	15000	3655	1044	210	700
corymbellu aureus			34						
phaeocysti pouchetii			50						
corethron criophilum	24	45	16	20	36	9		14	4
leptocylin danicus		5			109	23			
skeletonem costatum	8	15	15	22	23080	36370	18160	20	950
thalassios spp.		5	5		59				
thalassios rotula	4				1221	690	549		
thalassios aestivalis					27				
thalassios nordenskiold	12	28	2		363	68	45		7
thalassios pacifica	53	131	32	18	1457	1825	781	19	6
thalassios pseudonana	2744	4312		930	3723			820	
thalassios conferta	84	80	135	76	291	186	36	75	15
lauderia borealis					54				
eucampia zoodiacus					163	23			2
ditylum brightwellii					182		5		
chaetocero cinctum /crucifer			932	92	631	8217	6038	38	80
chaetocero compressum	66	51	120	30	2906	5675	3850	35	1
chaetocero convolutum /concavicorn	2			2	54	23	36		
chaetocero constrictum /vanheurckii					418	27	1117		
chaetocero debile	24	168		16	28190	7954	10680	26	1
chaetocero diadema						459	776		
chaetocero didymum					54	309			
chaetocero filiforme	30	28	12	8	109			4	2
chaetocero laciniosum		6			186				
chaetocero lorenzianum						118	36		
chaetocero pseudocrinit					1444				

Continued	20–7	21–10	22–8	23–8	24–8	25–8	26–9	27–9	28–10
chaetocero radicans			9		2742	976	2052		
chaetocero septentriona					236	213	45		
chaetocero simile			8	4	64	386	45	5	
chaetocero sociale					173		54		
rhizosolen fragilissima v.1	12	13	10	12	41			10	1
rhizosolen stolterfothi			2		54				
asterionel glacialis					1380	1226	272		
thalassion bacillaris	2	3	4			27			
thalassion nitzschoides	12	12	6	24	182	377		16	3
pleurosigm acutum						5			
nitzschia americana	8	55	36	22	3700	2361	2197	8	4
nitzschia closterium					91				12
nitzschia closterium v.striatula	3276								
nitzschia cylindroform		3388	235	1880	1389	327	1389	156	565
nitzschia delicatissim	82	260	142	42	1598	917	558	34	10
nitzschia granii v.curvata									3
nitzschia lineola	6			14	45	54	41		2
nitzschia longissima	2	5		3	236	254	191	2	
nitzschia pungens							45		
nitzschia seriata	8	6		12	50		191	12	25
nitzschia subfraudulen / fraudulen						64			
nitzschia subpacifica	60	63	210	88	359	173			
cylindroth fusiformis	2								
tetraselmi spp. /pyramimonas	242	316		36	527				
eutreptiel spp.	8		5		18				
prorocentr balticum		7						2	
gymnodiniu spp.	28	18	76	47	23	54		7	8
katodinium rotundatum	422	25	53	46	245	32		56	22
gyrodinium spp.	520	14	18	55	27	18		71	
peridiniac spp.		3	7	42	23			15	1
cryptomona spp. 5–10	16990	2800	1040	5757	4154	3496	145	5236	2120

Continued	20–7	21–10	22–8	23–8	24–8	25–8	26–9	27–9	28–10
cryptomona spp. 11–20	2968	1190	1200	1988	522	145	436	302	1500
mesodinium rubrum		3000			3632				

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Taxon	Station 29–4	31–5	33–5	35–5	37–6	39–7	40–1	41–9	43–9
ochromonas spp.		1612	236	1680	1450		10490		
dinobryon suecicum								136	
dictyocha speculum							6		
apedinella spinifera		68						8	
meringosph mediterranea								12	
imantonia rotunda	572	11440	1416	6719	620	7524	13570	6669	7763
corethron criophilum							6		
detonula pumila	27		68						
leptocylin danicus	227	518	327	518	960	22	189	142	254
leptocylin minimus	27								
stephanopy palmeriana	18	163		27	130		84	830	1752
skeletonem costatum	7627	9588		163	570	6	483	561	663
thalassios spp.		36		14	4				18
thalassios anguste–line					3				
thalassios conferta	23	54	191	95	216	98	17	91	318
thalassios nordenskiold	390	1780	54	254	560	2	74	230	200
thalassios pacifica	1416	64		318	82	34	37	34	282
thalassios rotula	41	254	9	14	12	6		1	82
coscinodis spp.					4		2		9
lauderia borealis		14		54	70		36		136
biddulphi longicruris		5	14		6			4	27
eucampia zoodiacus	54	463	104	1117	225	2	32	272	645
cerataulin pelagica		5			10				
ditylum brightwellii	9	82	5	27	5		6		18
chaetocero boreale		54	114	313	140		6	16	54
chaetocero cinctum /crucifer					712			202	572
chaetocero compressum		2679	908						2406
chaetocero convolutum /concavicorn			14	27			3	2	36

Continued	29–4	31–5	33–5	35–5	37–6	39–7	40–1	41–9	43–9
chaetocero constrictum /vanheurckii	3360	7128	7582	386	886		402	4320	1598
chaetocero debile	4821	16250	2570	272	7010		13	90	13660
chaetocero diadema		2206	91						
chaetocero didymum	36	690			20				
chaetocero filiforme		726	23	73		11	36		
chaetocero laciniosum	23	763					10	22	68
chaetocero lorenzianum	522	11620	82	150	216	2		146	218
chaetocero pelagicum				191		8	2830	170	118
chaetocero radicans		1280							
chaetocero septentriona	536	245	2315	345	530	4	18	910	1367
chaetocero simile	27	795	114						
chaetocero sociale	28870	34370	40860	5380	7080			296	11620
rhizosolen alata f.alata			5	14	4				
rhizosolen alata f.gracillima		14	9	18	6		9	5	18
rhizosolen alata f.indica			5						
rhizosolen delicatula		14		41	5		9	14	91
rhizosolen fragilissima		41	5	73	7	3			18
rhizosolen fragilissima v.1	36	32		163		3		15	
rhizosolen setigera				9			3	20	18
rhizosolen stolterfothi	9	14	9	23	10		45	34	45
asterionel glacialis					6		6	11	
thalassiot longissima				5					
thalassion bacillaris	36			14	16	2	18	55	9
thalassion nitzschoides	835	363	885	1090	120	18	132	295	581
pleurosigm acutum		9			1		2		
pleurosigm angulatum					2				
tropidonei lepidoptera			5		1		1	1	9
amphora spp.		9		23		1			
nitzschia americana	3246	4812	3201	581	350	41	250	164	667
nitzschia closterium	36	127							145
nitzschia closterium v.striatula						1			

Continued	29–4	31–5	33–5	35–5	37–6	39–7	40–1	41–9	43–9
nitzschia cylindroform						272	57		
nitzschia delicatissim	2406	4812	1090	68	122	20	75	170	5493
nitzschia granii v.curvata								13	
nitzschia lineola	844	245	54	118	47	14	22	30	227
nitzschia longissima	350	363	145	27	68	22	26	66	872
nitzschia pungens	250	372	73	82	15	2	17	36	681
nitzschia seriata	1053	2107		1643	619		9		509
nitzschia subcurvata					6				
nitzschia subfraudulen /fraudulen	1416	431			32	10	14	88	100
nitzschia subpacifica		1653	1140	127	218	26	47	42	322
cylindroth fusiformis			5	18		2	4	4	27
tetraselmi spp. /pyramimonas		1108		64				28	
cymbomonas spp.		23							
pterosperm spp. /pachysphaer		27						14	
eutreptiel spp.							3		
prorocentr balticum									73
prorocentr gracile		68							
dinophysis spp.			5				2	2	
gonyaulax rugosum				18					
gymnodiniu spp.		182	118	327		76	195	186	27
katodinium rotundatum		413				4		72	
gyrodinium spp.		68		50		38	126	90	36
peridiniac spp.	27	123						132	41
gonyaulax spp.								1	
ceratium spp.	5	5	9	14			5	1	9
heterosigm akashiwo		77				3		73	
cryptomona spp. 5–10	127	2542	118	73		148	6384	3192	377
cryptomona spp. 11–20		963	54	45	82	114	1820	1070	204
mesodinium rubrum		27							

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Taxon	Station 45–9	46–8	48–8	50–9	52–7	54A–9	54A–9	56–7	58–4
ochromonas spp.		50		490	1540	917	436		
dinobryon suecicum				32					
dictyocha speculum				45			18		
apedinella spinifera						68			
meringosph mediterranea	82								
imantonia rotunda		670	2247	8898	17330	4631	4086	1071	5675
corymbellu aureus							10580		
phaeocysti pouchetii			5993			2974			
detonula pumila						109			
leptocylin danicus	145	8	36	127	6	150	50	272	272
leptocylin minimus						209			
leptocylin mediterraneu					1			9	5
stephanopy palmeriana	808	108	1253	917	26	527	1725	163	227
skeletonem costatum	5448	8	145	218	16	1439	3768	1298	1049
thalassios spp.			36		2	32	18	100	
thalassios aestivalis						36			
thalassios conferta	295	82	731	282	1375	1816	2588	518	159
thalassios nordenskiold	82	11	23	54		136	136	2188	104
thalassios pacifica	27	3	54	282	56	109	91	935	127
thalassios rotula	9						18	68	45
coscinodis spp.							9		
lauderia borealis	36		9	18	2	118	100	381	91
biddulphi longicruris	9	2				45	36		
eucampia zoodiacus	91	60	381	645	18	1044	908	390	309
cerataulin pelagica								9	
ditylum brightwellii				9				9	5
chaetocero boreale	54			73		54		18	127
chaetocero cinctum /crucifer	2270	14	54	109	13	1480	4585	213	

Continued	45–9	46–8	48–8	50–9	52–7	54A–9	54A–9	56–7	58–4
chaetocero compressum	36			191	29	363	863	3496	563
chaetocero convolutum /concavicorı	45	10	45	32	2	36	18	9	14
chaetocero constrictum /vanheurckii	4022	190	5067	15570	290	29150	32050	2747	3287
chaetocero debile	1271	10	11850	282		2315	1680	1825	826
chaetocero diadema		4		472		2034	418	91	
chaetocero didymum			182	27		82			
chaetocero filiforme						1562		27	
chaetocero lorenzianum	254	40	227	381	24	772	717	54	45
chaetocero pelagicum					1220	1843	9125	5321	59
chaetocero septentriona	4994	165	182	295	16	6129	5221	354	223
chaetocero simile								894	114
chaetocero sociale	2774	20	826	1171		35410	18700	254	9675
rhizosolen alata f.alata	18				3	5			5
rhizosolen alata f.gracillima		4	18		2	27	59	23	36
rhizosolen bergonii					3				
rhizosolen delicatula	23	2	54		4	18	54	54	32
rhizosolen fragilissima	9	2	9	18	2	9			9
rhizosolen fragilissima v.1				23		536			
rhizosolen stolterfothi	54	3	18	45	5		45	73	68
thalassion bacillaris		4	73	191	2				14
thalassion nitzschoides	259	70	736	354	111	1189	672	227	486
tropidonei lepidoptera						9	14		
amphora spp.			9						
nitzschia americana	318	112	2097	1580	520	4131	3814	490	372
nitzschia closterium			9						
nitzschia closterium v.striatula				109					
nitzschia cylindroform			245		85				
asterionel glacialis							9	9	
nitzschia delicatissim	57200	14	413	381	170	2020	1734	345	509
nitzschia lineola	68		68	54	35	763	254	68	91
nitzschia longissima	327	8	82	145	24	390	341	41	41

Continued	45–9	46–8	48–8	50–9	52–7	54A–9	54A–9	56–7	58–4
nitzschia pungens	91	10	490	300	2	1121	395	45	27
nitzschia seriata	173	24		27	11	817	327	722	182
nitzschia subfraudulen /fraudulen	45	8							
nitzschia subpacifica		6	100	18				77	291
cylindroth fusiformis		6	9	27					9
tetraselmi spp. /pyramimonas						213	109		
prorocentr balticum					11				
prorocentr gracile				23					
dinophysis spp.						5			
gymnodiniu spp.	145	210	95	109	122	717	363	123	82
gymnodiniu nelsonii							18		5
katodinium rotundatum			45		26				
gyrodinium spp.	59	36	32		40	82	173	54	77
peridiniac spp.			23	150		345		32	14
gonyaulax spp.		3							14
ceratium spp.	9			23			23		9
cryptomona spp. 5–10		475	390	3496	4872	3995	799	68	18
cryptomona spp. 11–20	191	250	908	354	15	381	990	123	68
mesodinium rubrum									54

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Taxon	Station 60–4	61–3	63–7	65–8	66–9	67–6	68–8	69–6	70–6
ochromonas spp.					400		76		463
dinobryon suecicum			64		15				
dictyocha speculum			9		1				
apedinella spinifera				12	40				36
imantonia rotunda		2906	472	6270	3819	1930	735	17030	8444
corymbellu aureus	4131				166				
phaeocysti pouchetii					710				
corethron criophilum						32		36	36
detonula pumila	127	381	1317		3				5
leptocylin danicus	109	163	263	11	142	5	20		50
leptocylin mediterraneu				5			10		
stephanopy palmeriana	300	472	145	582	20	45	57	9	
cyclotella caspia		9							
skeletonem costatum	5902	7228	11170	720	45	14850	1050	7909	
thalassios spp.	54			39		77	16	59	18
thalassios aestivalis	73	73	318	102		50	20		18
thalassios anguste–line							6		
thalassios conferta		427	1398	845	675	309	162	191	118
thalassios eccentrica /symmetrica									5
thalassios nordenskiold	363	1199	699	336		804	76	91	23
thalassios pacifica	82	354	636	273		1698	24	867	177
thalassios rotula	27			36		1153	58	599	18
coscinodis spp.	23			1				9	5
lauderia borealis	263	191	327	114	2	9		18	
actinoptyc senarius				3					
biddulphi longicruris				4			2		
eucampia zoodiacus	527	127	1208	366	960	73	132	45	
ditylum brightwellii	9		18	2		109	7	91	5

Continued	60–4	61–3	63–7	65–8	66–9	67–6	68–8	69–6	70–6
cerataulin pelagica						9			
chaetocero sp.m									14
chaetocero boreale	154		91						
chaetocero cinctum /crucifer	2597	1180	6765		30	2851	1580	68	291
chaetocero compressum		1734	2542			8567	1580	381	241
chaetocero convolutum /concavicorn	36			9	3	109	7	127	5
chaetocero constrictum /vanheurckii	3292	1780	1557	1162	402	3455	770	73	45
chaetocero debile	7082	82	953	3102	15	78630	1610	8054	785
chaetocero diadema	27	163			22		256		32
chaetocero didymum		32		74		218	110	59	
chaetocero filiforme				84	26	109		54	50
chaetocero laciniosum				120		3337		263	18
chaetocero lorenzianum	227	227	163	104	10			68	9
chaetocero pelagicum		145	163	36	22	953	72		
chaetocero pseudocrinit		136							14
chaetocero radicans						6292		318	45
chaetocero septentriona	381	690	636	1120		282		18	
chaetocero simile	372	136	418			527		254	5
chaetocero sociale	21560	2297	12080	11820		5085	3160	114	18
chaetocero subtile								36	
bacteriast delicatula		100							
rhizosolen alata f.gracillima		27	36	12					
rhizosolen bergonii				4					
rhizosolen delicatula	54	23	73	8	17				
rhizosolen fragilissima		64	45	10		9	12	14	
rhizosolen fragilissima v.1		227	9	85			32		
rhizosolen setigera			41						
rhizosolen stolterfothi	9	59	136	86	2	73		18	14
asterionel glacialis			182			1525	15	291	59
thalassiot frauenfeldii					1				
thalassion bacillaris			36	13	21				5

Continued	60–4	61–3	63–7	65–8	66–9	67–6	68–8	69–6	70–6
thalassion nitzschoides	581	136	363	552	220	454	100	272	45
pleurosigm acutum	9					9			
tropidonei lepidoptera	9								
amphora spp.				6					
nitzschia americana	1271	981	1339	1630	345	4495	765	763	136
nitzschia closterium						136	62	77	
nitzschia cylindroform	64				360			163	350
nitzschia delicatissim	95	849	763	640	82	4722	90	286	54
nitzschia granii v.curvata	9						10		
nitzschia lineola	708	154	617	160	15	581	178	14	
nitzschia longissima	209	91	381	150	38	127	108	73	14
nitzschia pseudodelica		36	82		11		32		
nitzschia pungens	45	82	254	320	20	73	22	18	
nitzschia seriata	640	400	2088	256		1598		59	86
nitzschia subpacifica	549								
cylindroth fusiformis				5	4		2		5
tetraselmi spp. /pyramimonas		36						36	123
prorocentr gracile		23							
dinophysis spp.				3					
gymnodiniu spp.	23	23	68	128	120	68	78	18	91
gymnodiniu nelsonii			9						
katodinium rotundatum								23	23
gyrodinium spp.			45	59	30	36	15	18	23
peridiniac spp.		32		14		50		36	
heterocaps triquetra		14							
ceratium spp.		9	5	3					
cryptomona spp. 5–10		254	3723	172	1060	2710	605	300	1208
cryptomona spp. 11–20		77	191	78	80	136	248	1507	872
mesodinium rubrum				8					

CRUISE 80–08

Taxon	Station 71–10	73–9	74–9	75–7	76–8	77–7	78–7	79–7	80–7
ochromonas spp.	620				2100	3087		635	
dinobryon suecicum	186								
dictyocha speculum		2	14		6		1	2	11
apedinella spinifera			91		230			16	12
imantonia rotunda	7410	15390	2656		48790	11950	8322	20750	7068
corymbellu aureus	110	12							
leyanella arenaria					14360				30550
corethron criophilum			18	82	7	64	44	18	5
detonula pumila	4			581					
leptocylin danicus	11	62	36	145		100		4	
leptocylin mediterraneu		14							
stephanopy palmeriana	80	65	36	27					
skeletonem costatum	121	52	509	23790	351	2134	320	136	22
thalassios spp.	9			68				8	
thalassios aestivalis				354					
thalassios angulata					2				
thalassios angulata								5	
thalassios conferta	71	84	68	1090	208	114	328	88	153
thalassios eccentrica /symmetrica				45					
thalassios elsayedii									116
thalassios leptopus									8
thalassios lineata			18						
thalassios nordenskiold		6	636	654	17	263	64	10	7
thalassios pacifica		41	82	116	166	372	40	155	15
thalassios pseudonana					29640			2212	
thalassios rotula	3	9	835	2429		159	58	35	
coscinodis spp.		1		14	2		4	3	2
lauderia borealis	8	11	27			18	6		
biddulphi longicruris		1							

Continued	71–10	73–9	74–9	75–7	76–8	77–7	78–7	79–7	80–7
eucampia zoodiacus	50	64	45	227		227	5	3	
cerataulin pelagica		6				18			
ditylum brightwellii		2	68	209	4	136	10	7	14
chaetocero sp.m				999					
chaetocero boreale						64			
chaetocero cinctum /crucifer		26	3859	12120	9	1598	404	480	
chaetocero compressum			12350	14160	77	5879	940	172	17
chaetocero convolutum /concavicom		6	36	254		18	44	40	10
chaetocero constrictum /vanheurckii	92	187	1430	9080		1880	87		37
chaetocero debile		246	18390	20250	1155	9470	1180	566	1070
chaetocero diadema			354	7082		104	35		
chaetocero didymum			82	994		132		24	
chaetocero filiforme							62		
chaetocero laciniosum				8081		104	470		
chaetocero lorenzianum			163	2043		159	94	6	
chaetocero pseudocrinit				6038					
chaetocero radicans			1762	2951	52	2788	376	74	190
chaetocero septentriona		3	536	1144		191	182		
chaetocero simile			331	1126	25	209		24	40
chaetocero simplex		12							
chaetocero sociale		125	368	9897		972			
chaetocero subtile					22		27		18
rhizosolen alata f.gracillima		2							
rhizosolen delicatula						9			
rhizosolen fragilissima	4	14	14	54	6	36	3		
rhizosolen fragilissima v.1	122	84	18	236		36	420	2	
rhizosolen setigera		2	14			9			
rhizosolen stolterfothi	38	22	9	73	4	163	6	8	7
asterionel glacialis			1162	8263	22	654	158	46	8
thalassion bacillaris	45	78		41		9	4		
thalassion nitzschoides	156	468	295	1884	127	381	83	68	75

Continued	71–10	73–9	74–9	75–7	76–8	77–7	78–7	79–7	80–7
pleurosigm acutum				23			2		1
tropidonei lepidoptera		3	5						
amphora spp.		6							
nitzschia americana	12	148	6538	10300	484	6174		100	396
nitzschia bicapitata									38
nitzschia closterium				300	92	59		20	11
nitzschia cylindroform	374	180					4060	2184	115
nitzschia delicatissim	22	15	654	2383	131	440	82	17	127
nitzschia lineola	5	21	27	123	3	32	9	5	
nitzschia longissima	36	30	254	209	26	322	40	18	18
nitzschia pungens	21	70	36	173		36	7		
nitzschia seriata	23	88	545		12	245	61	44	
nitzschia subfraudulen /fraudulen				1489					
nitzschia subpacifica	13	10		599		27	10	5	7
cylindroth fusiformis				27	2	9	3		
tetraselmi spp. /pyramimonas	13				1590			60	75
cymbomonas spp.	34								
eutreptiel spp.						9			
prorocentr balticum	4	9			10				4
prorocentr gracile	30				3			2	
gonyaulax rugosum	4								
gymnodiniu spp.	140	354	91	509	172	173	36	60	
gymnodiniu nelsonii		1							
katodinium rotundatum		36			154		132	125	10
gyrodinium spp.	45	162		118	76	73	18	46	
peridiniac spp.	88	32	23		15	36	6	16	13
gonyaulax spp.								3	
ceratium spp.	5	3							
heterosigm akashiwo								20	
cryptomona spp. 5–10	655	2050	254		8151	536	5073	4956	4872
cryptomona spp. 11–20	250	500	173		2540	191	920	2330	920

Continued	71–10	73–9	74–9	75–7	76–8	77–7	78–7	79–7	80–7
mesodinium rubrum	7					45	16	5	7

CRUISE 80–08

Taxon	Station 81–4
imantonia rotunda	17560
corethron criophilum	7
leptocylin danicus	7
stephanopy palmeriana	5
skeletonem costatum	186
thalassios spp.	6
thalassios aestivalis	33
thalassios conferta	9
thalassios eccentrica /symmetrica	8
thalassios nordenskiold	38
thalassios pacifica	190
thalassios rotula	89
coscinodis spp.	3
lauderia borealis	6
eucampia zoodiacus	8
chaetocero compressum	40
chaetocero convolutum /concavicori	16
chaetocero debile	190
chaetocero decipiens	6
chaetocero didymum	7
chaetocero laciniosum	27
chaetocero lorenzianum	32
chaetocero pseudocrinit	15
chaetocero radicans	36
rhizosolen stolterfothi	2
asterionel glacialis	22
thalassion bacillaris	8
thalassion nitzschoides	2
tropidonei lepidoptera	1

Continued	81–4
nitzschia americana	84
nitzschia closterium	57
nitzschia delicatissim	42
nitzschia longissima	6
nitzschia seriata	4
cylindroth fusiformis	2
tetraselmi spp. /pyramimonas	10
katodinium rotundatum	28
peridiniac spp.	16
cryptomona spp. 5–10	2280
cryptomona spp. 11–20	296

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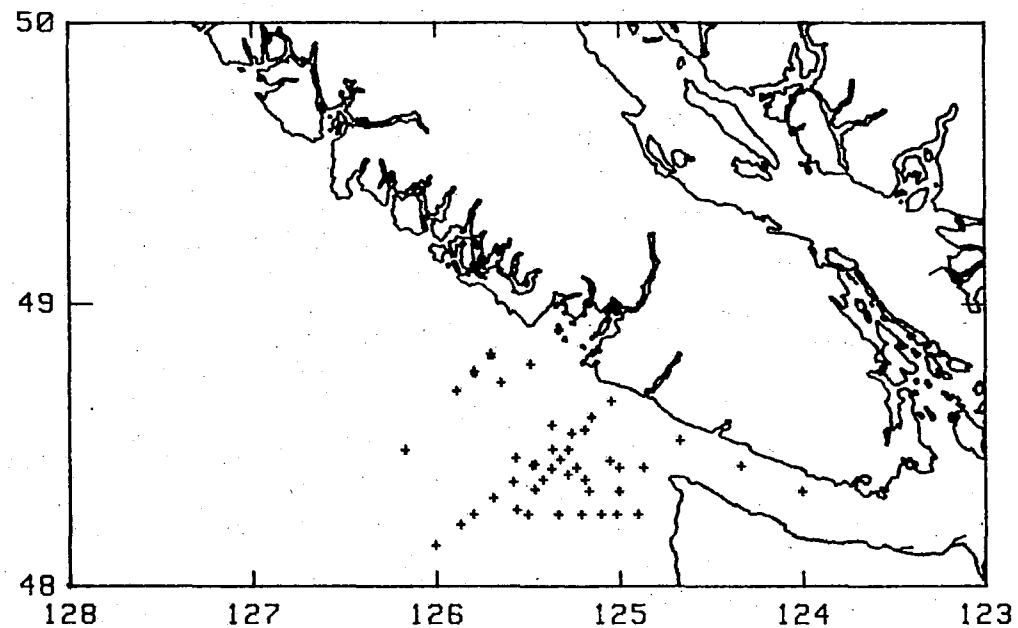
CRUISE 81–05

27 April – 8 May 1981

Area of operations: Continental shelf off southwest Vancouver Island

Vessel: C.S.S. Parizeau



CRUISE 81–05

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
3–4	29 April 81	48 49.2	125 42.0	4.0	9.9	30.15	1.7	5.0	0.78	6.7
5–4		48 45.4	125 47.4	8.3	9.9	30.75	2.6	5.0	0.75	7.1
7–4		48 41.2	125 53.0	8.9	9.9	30.68	0.4	3.8	0.66	5.1
13–7		48 28.8	126 10.0	74.1	9.3	32.72	0.3	14.7	1.40	23.3
16–9	30 April 81	48 47.0	125 29.0	16.5	10.0	31.36	0.9	2.6	0.63	5.7
17–7	1 May 81	48 15.0	125 30.0	9.1	10.2	30.92	0.7	6.4	0.84	9.7
18–5		48 15.0	125 20.0	7.0	10.5	31.28	0.9	2.4	0.70	6.7
19–9		48 15.0	125 12.5	10.7	10.5	31.33	0.9	0.2	0.50	5.2
20–6		48 15.0	125 06.0	11.1	10.2	31.57	0.6	5.0	0.73	11.2
21–9		48 15.0	125 01.0	18.7	9.6	31.55	0.8	8.8	1.06	14.9
22–5		48 15.0	124 54.0	10.9	11.0	29.13	1.4	1.6	0.56	8.9
23–7		48 20.0	125 00.0	34.2	9.7	31.96	0.3	6.0	0.79	11.5
24–7		48 20.0	125 10.0	14.6	10.0	31.89	0.8	1.0	0.51	8.2
25–7		48 25.0	125 14.0	22.3	9.6	32.21	0.7	4.8	0.78	10.0
26–8		48 26.5	125 03.0	11.4	10.1	30.89	10.2	4.2	0.60	6.9
27–9		48 25.0	125 00.0	10.0	10.3	31.33	1.3	5.0	0.76	10.7
28–8		48 25.0	124 52.0	28.7	9.6	30.90	6.7	11.4	1.20	17.7
29–7	3 May 81	48 08.5	126 00.0	53.3	10.0	32.36	0.2	3.2	0.68	9.9
31–9		48 12.9	125 52.0	15.8	10.1	31.72	1.0	2.0	0.67	10.4
32–8		48 15.1	125 47.7	15.5	10.2	31.79	1.1	0.7	0.58	11.0
33–7		48 18.6	125 41.2	15.4	10.3	31.54	1.6	1.9	0.61	7.2
34–7		48 22.0	125 34.7	5.5	10.3	30.98	11.0	0.6	0.44	3.1
35–6		48 25.5	125 28.3	10.3	10.2	31.03	1.3	1.3	0.65	2.9
36–8		48 28.9	125 21.8	3.0	10.4	30.87	19.0	0.0	1.37	1.3
37–6		48 32.2	125 15.5	5.4	10.7	30.62	12.3	0.1	0.45	2.7
38–6		48 35.6	125 09.0	5.7	10.5	29.99	2.5	3.7	0.59	6.9
39–4		48 39.0	125 02.5	10.8	9.7	30.79	1.7	8.3	1.06	11.6
40–7	4 May 81	48 34.0	125 22.0	9.0	10.0	31.11	14.4	3.6	0.64	3.6
41–8		48 43.0	125 38.5	20.5	9.6	30.89	11.0	7.9	1.16	8.8
42–1	6 May 81	48 16.0	125 33.6	28.9	9.6	31.75	3.4			
43–3		48 20.5	125 27.6	24.9	9.3	31.65	5.9	0.0	0.32	0.5
44–2		48 22.5	125 25.0	3.9	10.7	30.89	2.8	0.7	0.44	5.4
45–2		48 26.8	125 19.3	10.6	10.0	31.86	0.9			
46–3		48 28.9	125 16.6	14.4	10.2	31.56	1.2			
47–4		48 33.0	125 11.2	3.1	10.9	29.20	3.3			

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
48–3	6 May 81	48 20.0	125 00.0	24.4	9.4	31.06	7.8			
49–5		48 22.4	125 11.2	4.4	10.7	29.71	3.5			
50–2		48 23.6	125 16.8	28.4	9.2	31.92	3.1			
51–7		48 24.8	125 22.2	3.0	10.5	31.14	2.1			
52–3		48 25.8	125 27.6	9.6	10.5	31.01	3.5			
53–2		48 27.1	125 33.8	10.1	10.1	31.34	3.8	19.6		
55–9	7 May 81	48 30.8	124 40.0	10.5	9.1	31.27	1.4	20.1	1.57	32.3
56–9		48 25.4	124 20.0	8.6	9.1	31.27	1.3	22.9	2.02	37.6
57–7	8 May 81	48 20.0	124 00.0	8.3	9.2	31.36	2.9	19.3	1.64	32.5

CRUISE 81–05

Station	3–4	5–4	7–4	13–7	16–9	17–7	18–5	19–9	20–6
Taxon									
ochromonas spp.	103	8	76	1	433	263	901	129	98
dictyocha speculum						*	*		
apedinella spinifera		15							
Imantonia rotunda	1300	86	864	6	1824	2599	3089	1311	684
leyanella arenaria	747		420		1328	804	1094	963	798
detonula pumila		44							
leptocylin danicus			2	*			*	*	*
leptocylin minimus	13	61	66	*	1	1	1	4	1
cyclotella caspia		1							
skeletonem costatum	62		113	4			1	1	1
thalassios spp.	2	5	5	*	*	*	*		*
thalassios sp.1			1						
thalassios aestivalis	*	1	1						*
thalassios binata		2							
thalassios conferta	3	22	5	1	2	8	2	1	2
thalassios nordenskiold	2	4	11	*			*	*	1
thalassios pacifica	5	7	29	*	*	1	1	*	1
thalassios pseudonana	97	29	49	10	633	65	2052	241	1009
thalassios rotula	1	1	7				*	*	*
coscinodis spp.	*		1	*					*
lauderia borealis	4	5	4					*	*
asterompha sp.1	*	1	3						*
chaetocero compressum	9	66	45	*					
chaetocero constrictum /vanheurckii	7								
chaetocero debile	1		11	*					
chaetocero diadema	7								
chaetocero didymum	2	5	5	*					

Continued	3–4	5–4	7–4	13–7	16–9	17–7	18–5	19–9	20–6
chaetocero filiforme	38	18	24	*	7	4	34	13	26
chaetocero radicans	34		230						
chaetocero sociale	2		19						
chaetocero subtile					1	1	1		
bacteriast delicatula	8		25				1		
rhizosolen alata f.gracillima	1	*	4						
rhizosolen delicatula	1		4						
rhizosolen fragilissima		23	3	*					
rhizosolen fragilissima v.1	6		30		*	*	1	1	1
asterionel glacialis	14	25	57	1	*	1	1	*	*
thalassion nitzschoides	5	2	5	*	1	2	1	1	3
naviculace spp.		2		*					
nitzschia americana	4	2	3		5	3	4	3	6
nitzschia bicapitata	18	7	5	*	4	14	57	5	26
nitzschia closterium		1			*	*			
nitzschia cylindroform	1	12	15		2	5	5	2	50
nitzschia delicatissim	1	5	5	*	2	1	1	1	2
nitzschia granii v.curvata	1	1	2	*	*	*	*	*	
nitzschia longissima	1	1	1	*					
nitzschia pungens	1								
nitzschia seriata	*						*		
cylindroth fusiformis	1	2	2			804	*	1	
tetraselmi spp. /pyramimonas	5	64			2	9	3	3	1
pterosperm spp. /pachysphaer		3							
eutreptiel spp.	*		1						
prorocentr balticum	3	3	2		1	7	7	3	2
dinophysis spp.	*			*					
gymnodiniu spp.	7	14	7	1	7	7	2	1	6
katodinium rotundatum		48		*	19	6	1	12	5
gyrodinium spp.	37	1	5	1	8	2	2	8	4
peridiniac spp.	1	4		*					*

Continued	3–4	5–4	7–4	13–7	16–9	17–7	18–5	19–9	20–6
heterosigm akashiwo		17						5	4
cryptomona spp. 5–10	1151	420	354	*	918	581	316	718	409
cryptomona spp. 11–20	99	139	8	*	26	63	74	27	53
mesodinium rubrum		2				*	*	*	

CRUISE 81–05

Station	21–9	22–5	23–7	24–7	25–7	26–8	27–9	28–8	29–7
Taxon									
ochromonas spp.	21	132	13	246	90	48	263	90	31
dictyocha speculum					*				
apedinella spinifera			*						
meringosph mediterranea		1					1		
imantonia rotunda	198	3454	967	2645	488	953	5027	450	293
phaeocysti pouchetii								20	
leyanella arenaria	1	6076	27	300	654	534	6373	216	9
corethron criophilum					*	1			*
leptocylin danicus	*		*		*	5		2	
leptocylin minimus	*		*	1	*	11			
skeletonem costatum	2	*	*	1	*	334	1	194	*
thalassios spp.	*		*	*	*	7	*	6	*
thalassios aestivalis	*		*			8		3	
thalassios conferta	1	1	*	3	*	2	8	43	*
thalassios eccentrica /symmetrica							*		
thalassios leptopus	*						*		
thalassios mendiolana							*		
thalassios nordenskiold	1	*	*	*	*	62	1	35	*
thalassios pacifica	1	*	1	1	*	76	3	78	*
thalassios pseudonana	7	227	1	5	24	15	3591	27	1
thalassios rotula	*	*	*	*	*	19	*	15	*
coscinodis spp.	*		*	*				1	
lauderia borealis	*		*	*	*	1		6	
actinoptyc senarius	*								
cerataulin pelagica								2	
chaetocero compressum	*		*	*	*	77		79	

Continued	21–9	22–5	23–7	24–7	25–7	26–8	27–9	28–8	29–7
chaetocero convolutum /concavicorn							*	4	
chaetocero constrictum /vanheurckii	*		*	*	*	121		49	
chaetocero debile			1		*	30		17	
chaetocero diadema	*		*		*	8		36	
chaetocero didymum						9		3	
chaetocero filiforme	1	161	1	2	*	10	7	12	1
chaetocero laciniosum					*	5		17	
chaetocero lorenzianum			*						
chaetocero radicans	*		1	1	*	1275		360	
chaetocero sociale	*		*	*	*	91		18	
chaetocero subtile	*		*	1	*				
bacteriast delicatula				*	*	50		3	
rhizosolen alata f.alata								1	
rhizosolen alata f.gracillima			*	1	*	2		3	
rhizosolen delicatula			*	*		1			
rhizosolen fragilissima			*		*	5		1	
rhizosolen fragilissima v.1	*		*	1	*	6		3	
asterionel glacialis	1		*	1	*	223		147	*
asterionel kariana	*								
thalassion nitzschoides	2	8	*	*	*	12	5	20	*
nitzschia americana	*	2	1	1	*	71	1	45	*
nitzschia bicapitata	2	96	15	1	*	14	16	36	2
nitzschia closterium	*			*					
nitzschia cylindroform	3	25	4	18	10		21	12	1
nitzschia delicatissim	*	*	3	1	*	9		8	*
nitzschia granii v.curvata	*	*	*	*	*				
nitzschia longissima	*	*	*	*	*	7		3	*
nitzschia pseudodelica							*	1	
nitzschia pungens			*	*	*	7	*	5	*
nitzschia seriata	*		*	1	*	1	*	1	
cylindroth fusiformis	*		*	*	*				

Continued	21–9	22–5	23–7	24–7	25–7	26–8	27–9	28–8	29–7
tetraselmi spp. /pyramimonas	*	8	*	1	*	14	9		*
prorocentr balticum	*	3	1	1	*	10	3	7	*
gymnodiniu spp.	8	8	*	9	2	8	3	7	1
katodinium rotundatum	1	27		1	5	26	8		*
gyrodinium spp.	2	8	5	9	21	11	5	5	21
peridiniac spp.	*	*	*		*				
heterosigm akashiwo	*		*	5			4		
cryptomona spp. 5–10	38	1083	40	165	242	39	512	36	23
cryptomona spp. 11–20	13	45	14	10	72	127	31	11	*
mesodinium rubrum	*	1	*	*	*	3		5	

CRUISE 81–05

Station	31–9	32–8	33–7	34–7	35–6	36–8	37–6	38–6	39–4
Taxon									
ochromonas spp.	416	490	467	458	152	20	166	54	29
dictyocha speculum	*			1			1	*	*
apedinella spinifera							12		*
imantonia rotunda	1129	1334	6590	745	726	220	1489	554	260
corymbellu aureus			2						
phaeocysti pouchetii						6			
leyanella arenaria	1197	838	1600	202	356	9	178	2314	148
leptocylin minimus				10	3		17	7	
cyclotella caspia						*			*
skeletonem costatum	2	3		354	397	141	350	13	7
thalassios spp.	*	*		12	10	3	5	3	2
thalassios sp.1						1			
thalassios aestivalis				2		1	3		
thalassios anguste–line						*			
thalassios binata			1			1			1
thalassios conferta	7	6	4	9	23	1	13	*	2
thalassios eccentrica /symmetrica						*			1
thalassios leptopus					3	2	1	1	6
thalassios mendiolana						*		1	*
thalassios nordenskiold	*	*		125	56	9	26	1	
thalassios pacifica	*	*		178	112	11	97	7	2
thalassios pseudonana	123	52	826	56	34	50	2924	52	102
thalassios rotula		*		43	24	1	10	1	
coscinodis spp.				1					
lauderia borealis				8	8	2			1
cerataulin pelagica				3	4				
ditylum brightwellii									*

Continued	31–9	32–8	33–7	34–7	35–6	36–8	37–6	38–6	39–4
chaetocero affine						9			1
chaetocero compressum				429	1608	47	882	21	10
chaetocero convolutum /concavicorn				3					
chaetocero constrictum /vanheurckii				36	267	30	35	5	4
chaetocero danicum									*
chaetocero debile				84	601	34	382	3	*
chaetocero diadema				27	173	18	16	3	1
chaetocero didymum				7	86	1		1	7
chaetocero filiforme	12	2		76	11	1	17	37	
chaetocero laciniosum				5				1	
chaetocero lorenzianum				5		8		2	1
chaetocero radicans				1317	2845	572	940	79	52
chaetocero septentriona					5	*	2	5	1
chaetocero sociale				107	1121	35	252	18	1
chaetocero subtile				7	4		5		
bacteriast delicatula				35	23	16	23	5	2
rhizosolen alata f.alata						*			
rhizosolen alata f.gracillima				4	4	1	1	*	1
rhizosolen delicatula				6	1	*	3		
rhizosolen fragilissima				1	1	3	3	1	1
rhizosolen fragilissima v.1				13	12		13	1	
rhizosolen setigera								*	
asterionel glacialis				360	527	110	282	15	20
asterionel kariana				8	5	2	1	2	1
thalassion nitzschoides		*	*	20	16	2	24	19	8
naviculace spp.			1						*
gyrosigma spp. pleurosigma						*			
pleurosigm acutum					1				
nitzschia americana	2	1	5	60	136	8	61	6	
nitzschia bicapitata		2	1	53	14	7	55	91	7
nitzschia closterium						1			*

Continued	31–9	32–8	33–7	34–7	35–6	36–8	37–6	38–6	39–4
nitzschia cylindroform	60	69	6	49	3		49	2	2
nitzschia delicatissim	1	1	*	14	23	5	23	2	1
nitzschia granii v.curvata			*	4	5	*		*	
nitzschia longissima	*	*		4	15	2	4	1	1
nitzschia pseudodelica	*			4			3		
nitzschia pungens				1	11	1	1	*	*
nitzschia seriata				1	4	3	3	1	
cylindroth fusiformis	*	*		2	1	*		*	1
tetraselmi spp. /pyramimonas	2	1	1		5	2	20	46	
pterosperm spp. /pachysphaer	*								
eutreptiel spp.									*
prorocentr balticum	*	*		2	1	*	10	8	
gymnodiniu spp.	14	2	5	14	7	1	14	2	3
katodinium rotundatum	5	2	3		2		15		*
gyrodinium spp.	26	17	26	16	2	2	2	1	1
peridiniac spp.							3	1	
heterosigm akashiwo							3		
cryptomona spp. 5–10	621	1083	1280	268	93	47	44	282	175
cryptomona spp. 11–20	68	46	69	85	11	6	272	73	10
mesodinium rubrum				4			5	2	

CRUISE 81–05

Station	40–7	41–8	42–1	43–3	44–2	45–2	46–3	47–4	48–3
Taxon									
ochromonas spp.	29	320		141	440	191	318	394	11800
dictyocha speculum	1						1		
apedinella spinifera					7			3	
meringosph mediterranea		1							1362
imantonia rotunda	876	78	413	92	2410	884	3509	2720	263300
corymbellu aureus					21			11	
phaeocysti pouchetii	147	11							
leyanella arenaria	21				1778	290	154	15840	410900
corethron criophilum					*				
leptocylin minimus	16	9		5	15		2	82	
cyclotella caspia		*	1						
skeletonem costatum	487	370	220	167	5	*	12	7	120300
thalassios spp.	7	9	4		*		3	1	6356
thalassios aestivalis	3	2	2						
thalassios anguste–line	1	*							908
thalassios binata		4			11				4540
thalassios conferta	34	11	15	17	53	*	4	7	15440
thalassios eccentrica /symmetrica			1		*	*			
thalassios leptopus	9	15	4						
thalassios mendiolana	1	2	1		1		*		1816
thalassios nordenskiold	45	19	4	14	1	*	1	*	20880
thalassios pacifica	147	18	14	6	*	*			66740
thalassios pseudonana	409	25	27	29	844	115	486	3649	161200
thalassios rotula	24	5	2			*	*		908
coscinodis spp.						*			454
lauderia borealis	5	2	1	1	*				908
asterompha sp.1					*				

Continued	40–7	41–8	42–1	43–3	44–2	45–2	46–3	47–4	48–3
cerataulin pelagica				1			1		
ditylum brightwellii	1								
chaetocero sp.m		2		4					
chaetocero affine		31							
chaetocero compressum	936	80	35	133	2	*	2		65830
chaetocero convolutum /concavicorn	1								
chaetocero constrictum /vanheurckii	164	48	3						
chaetocero debile	535	44	10	6	1	*	3		19070
chaetocero decipiens			3						
chaetocero diadema	127	27	18	13			3		22700
chaetocero didymum	75	29	10						23150
chaetocero filiforme	16	2		3	59	*	14	125	
chaetocero laciniosum	40								
chaetocero lorenzianum	34	3							
chaetocero radicans	3685	785	440	825	3	*	74	2	656900
chaetocero septentriona	21	6	1	1					2724
chaetocero simile		2							
chaetocero sociale	412	64	24	49	3	*	9	1	88530
chaetocero subtile					*				
bacteriast delicatula	7	7	5	4	2	*	12	2	3178
rhizosolen alata f.gracillima	5				1	*	1	*	
rhizosolen delicatula		1		2	*	*	2		
rhizosolen fragilissima	5	5	5	7	1	*	16	2	2724
rhizosolen fragilissima v.1	4				6			16	
asterionel glacialis	322	627	183	366	2	*	10		85350
asterionel kariana	5	10	5	8					
thalassion bacillaris							1		908
thalassion nitzschoides	11	10	7	23	10	*	1	8	1816
naviculace spp.		8	2	13					
nitzschia americana	82	25	17	20	5	*	2	22	40860
nitzschia bicapitata	68	8	2	33	29	*	8	763	9080

Continued	40–7	41–8	42–1	43–3	44–2	45–2	46–3	47–4	48–3
nitzschia cylindroform	46	5	7	8	183	9	4	15	
nitzschia closterium		3	1						
nitzschia delicatissim	29	17	10	14	6	3	2		6356
nitzschia granii v.curvata		3		3					
nitzschia longissima	8	1	1	8		*	*		4994
nitzschia pseudodelica		1	3			*			
nitzschia pungens	1	4			1	*			5902
nitzschia seriata	5		1	1	*				3632
cylindroth fusiformis	1				1	*		*	
tetraselmi spp. /pyramimonas			1		43	5		115	
prorocentr balticum	1	2		1	38	3	12	5	
dinophysis spp.					*				
gymnodiniu spp.		11	6	5	6	1	2	1	1816
katodinium rotundatum			15	2	6	6	33	4	3178
gyrodinium spp.		6	6	20	2	2	4	8	
peridiniac spp.	8	1			1	*		1	
ceratium spp.					*			*	
heterosigm akashiwo					3			19	
cryptomona spp.							738		
cryptomona spp. 5–10	195	21	117	41	507	210	695	538	73550
cryptomona spp. 11–20	14	2	9	28	302	9	44	31	10900
mesodinium rubrum					2	*		1	

CRUISE 81–05

Station	49–5	50–2	51–7	52–3	53–2	55–9	56–9	57–7
Taxon								
ochromonas spp.	354	53	160	336	108	4	33	29
dictyocha speculum		*		1	3			1
apedinella spinifera			1					1
meringosph mediterranea						*		
imantonia rotunda	4580	319	3694	3267	3079	73	131	87
corymbellu aureus	17		9	21				
phaeocysti pouchetii					4			
leyanella arenaria	11700		3454	6159	979	251	496	1811
corethron criophilum		*						
leptocylin minimus	64		66	118				
skeletonem costatum		145		4	60	18	7	18
thalassios spp.	1	3			1		2	14
thalassios aestivalis							*	
thalassios anguste–line		*				*		1
thalassios binata	3		6	24		1	4	
thalassios conferta	24	4	54	239	26	3	2	7
thalassios eccentrica /symmetrica							1	2
thalassios leptopus						*	1	
thalassios mendiolana		*			1	*	*	4
thalassios nordenskiold		9	*		7	1	2	2
thalassios pacifica	1	4	*	*	3	3	9	4
thalassios pseudonana	3830		878	1527	2275	92	1249	4813
thalassios rotula		*				*	2	1
coscinodis spp.						*		
lauderia borealis		1			5			
asterompha sp.1					1			
biddulphi aurita		*						

Continued	49–5	50–2	51–7	52–3	53–2	55–9	56–9	57–7
chaetocero affine		1			1	*	1	
chaetocero compressum		76			61	16	7	26
chaetocero convolutum /concavicom		*			1		1	
chaetocero constrictum /vanheurckii		7			2	3	6	6
chaetocero debile		3			6	2	2	8
chaetocero decipiens					3		1	
chaetocero diadema		3				4	1	7
chaetocero didymum		7		2	3	2	2	4
chaetocero filiforme	102		45	78	17	3	1	3
chaetocero laciniosum		2						
chaetocero lorenzianum					6			
chaetocero radicans		52		1	136	91	59	98
chaetocero septentriona		*				1		1
chaetocero simile								1
chaetocero sociale		5		3	44	12	2	19
chaetocero subtile						*	1	2
bacteriast delicatula		3		2	14	1	*	
rhizosolen alata f.alata		1						
rhizosolen alata f.gracillima		*						
rhizosolen delicatula		1	*					
rhizosolen fragilissima	2	4	1	15				
rhizosolen fragilissima v.1	10		5	23				
asterionel glacialis	913		*	2	65	36	15	15
thalassion nitzschoides	15	6	1	24	10	4	2	3
naviculace spp.		2					*	
gyrosigma spp. pleurosigma						*		
nitzschia americana	28	7	10	18	15	5	2	10
nitzschia bicapitata	640		75	318	4	2	5	
nitzschia closterium							1	1
nitzschia cylindroform	7	1	77	253	27	2		
nitzschia delicatissim		5	3	16	5	6	5	9

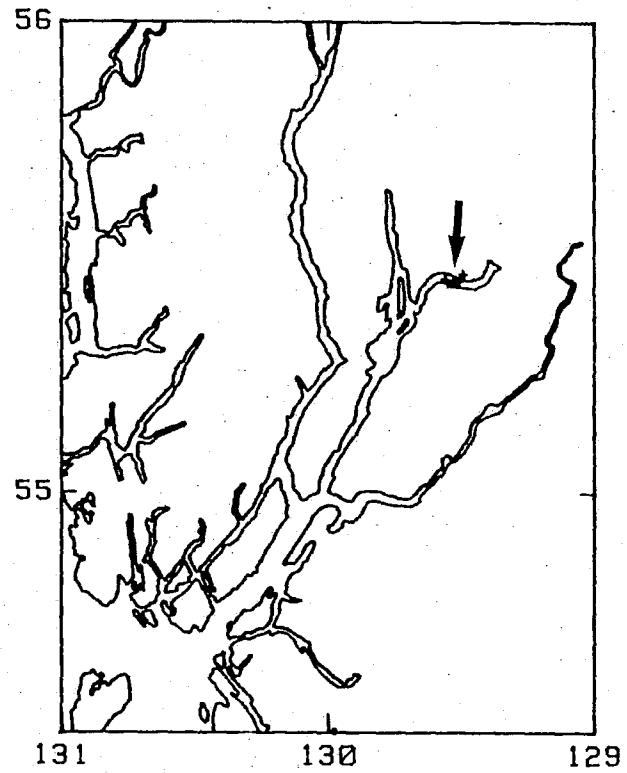
Continued	49–5	50–2	51–7	52–3	53–2	55–9	56–9	57–7
nitzschia longissima		*			1	1	3	5
nitzschia pseudodelica		1					*	
nitzschia pungens		3				*		
nitzschia seriata		1		*	1			1
cylindroth fusiformis		*	*	1	1		*	
tetraselmi spp. /pyramimonas	29		34	24			10	1
eutreptiel spp.				1				
prorocentr balticum	5		14	44	11			1
gymnodiniu spp.	6	2	7	4	18	3	9	3
katodinium rotundatum	6		39	68	79		1	4
gyrodinium spp.	2		4	22	4			
peridiniac spp.		*						*
ceratium spp.								*
heterosigm akashiwo	7		5	17			1	
cryptomona spp. 5–10	490		580	536	463		46	12
cryptomona spp. 11–20	44		24	23	66		10	11
mesodinium rubrum	1		2	11	8			1

CRUISE 81 – AA

10 – 24 August 1981

Area of operations: Alice Arm

Vessel: M.V. Bastion City



CRUISE 81–AA

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
P12	13 Aug. 81	55 26.8	129 30.4	10.0			0.6			
Q19		55 26.7	129 31.7	5.0			1.2			
R26		55 26.6	129 32.9	10.0			3.1			

CRUISE 81 – AA

Taxon	Station P12	Q19	R26
ochromonas spp.	168	7125	1635
dictyocha speculum	47	10	151
apedinella spinifera	4	122	7
meringosph mediterranea			
imantonia rotunda	496		
chrysochro spp.		2143	4902
thalassios mendiolana	*	1	
thalassios leptopus	1		*
coscinodis spp.	*	1	3
chaetocero lorenzianum		9	4
rhizosolen delicatula			2
rhizosolen hebetata f.semispina	*	2	8
thalassion nitzschoides	122	1860	2570
nitzschia pungens	*		1
nitzschia subfraudulen /fraudulen	*		2
tetraselmi spp. /pyramimonas	36	4676	155
eutreptiel spp.		12	2
dinophysis spp.	*	1	6
gymnodiniu spp.	76	456	190
gymnodiniu vitiligo	3	99	8
katodinium rotundatum	274	1610	144
peridiniac spp.		2	3
ceratium fusus	30	64	272
ceratium longipes	4	13	42
ceratium tripos	1	3	6
heterosigm akashiwo			
cryptomona spp. 5–10	1512	3699	5290
cryptomona spp. 11–20	504	960	3967

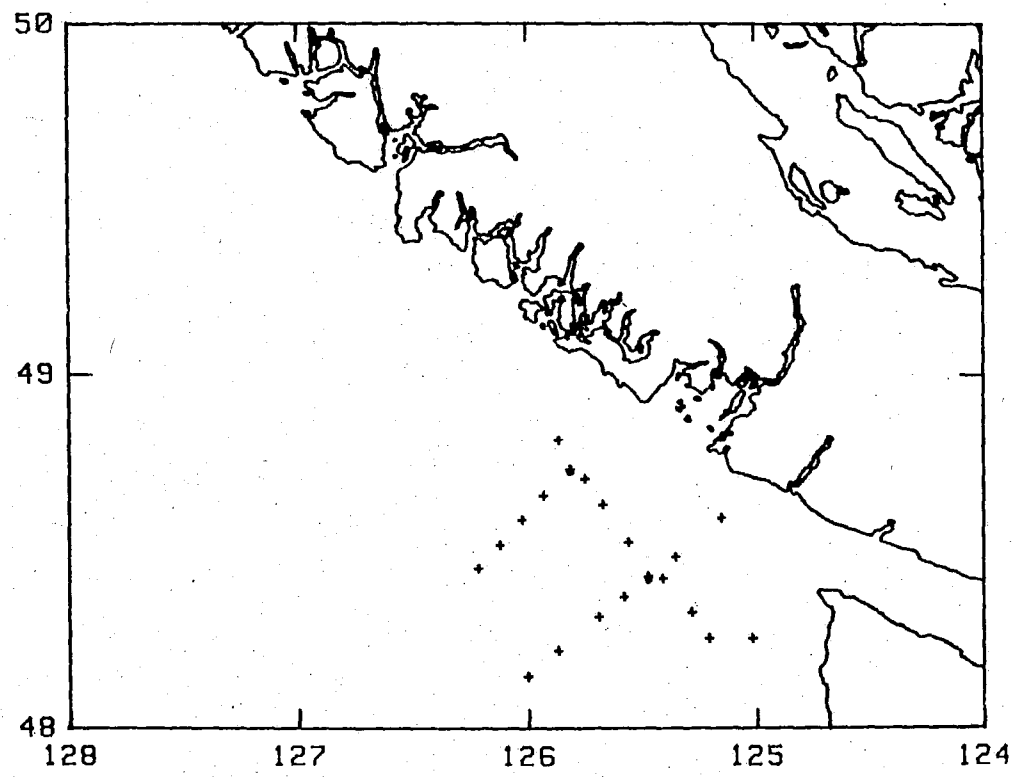
Continued	P12	Q19	R26
mesodinium rubrum		2	1

CRUISE 81 – 07

13 – 18 September 1981

Area of operations: Continental shelf off southwestern Vancouver Island

Vessel: C.S.S. Parizeau



CRUISE 81–07

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
6–7	14 Sept. 81	48 43.8	125 48.8	4.2	12.6	31.74	10.0	12.7	1.53	29.3
8–6	15 Sept. 81	48 39.3	125 55.8	5.4	11.9	31.80	2.0	17.5	1.67	35.3
10–5		48 35.2	126 01.4	18.4	11.7	31.83		18.1	1.64	36.2
12–8		48 31.0	126 07.1	10.8	11.7	31.82	1.0	20.0	1.77	38.5
14–9		48 26.9	126 12.8	17.9	10.3	32.36	1.3	8.4	1.80	12.6
15–5		48 48.8	125 51.8	4.1	12.2	31.74	8.6	11.8	1.54	29.4
18–8		48 42.2	125 44.8	5.3	12.7	31.47	15.7	3.5	0.00	12.4
20–5		48 37.8	125 40.1	4.7	11.2	31.10	1.4	22.1	2.02	42.9
23–7	16 Sept. 81	48 31.4	125 33.5	11.5	10.5	32.06	1.0	23.0	2.08	40.5
26–8		48 25.2	125 24.5	7.0	13.1	31.65	1.0	8.9	1.08	22.0
29–7		48 19.4	125 16.8	18.8	10.8	32.21	0.6			
31–5		48 35.6	125 09.0	11.0	9.3	32.09	0.2	27.2		46.4
33–8		48 28.9	125 21.0	8.3	10.4	32.54	1.0	14.1	1.76	29.3
34–7		48 25.5	125 28.3	9.0	12.3	31.89	1.4	14.3	1.61	30.3
35–7	17 Sept. 81	48 22.0	125 34.7	3.9	12.8	31.81	13.3	10.1	1.45	22.9
36–8		48 18.6	125 41.2	11.0	11.2	31.24	0.6	22.6	2.13	44.1
38–8		48 12.9	125 52.0	31.0	10.2	32.43	0.8			
40–8		48 08.5	126 00.0	31.3	10.7	32.21	0.8	6.5	1.17	10.2
41–8		48 15.0	125 12.5	7.5	13.1	32.06	7.7	5.6	1.06	15.1
43–8		48 15.0	125 01.0	33.4	8.8	32.79		27.4	2.30	42.2

CRUISE 81–07

Station	6–7	8–6	10–5	12–8	14–9	15–5	18–8	20–5	23–7
Taxon									
ochromonas spp.	9	44	67	62	63	25	122	109	171
dinobryon suecicum	7	6	3	4		4			
dictyocha speculum	*	1	1	1			2		1
apedinella spinifera	5	14	3	1		13		*	1
meringosph mediterranea	3	10	1	2		1		1	1
imantonia rotunda	92	134	333	44	576	177	1322	690	1197
corymbellu aureus	10		7	6		46	19		
phaeocysti pouchetii					12				
leyanella arenaria				139		129		177	205
detonula pumila		10							
leptocylin danicus	10	9	1	1		1	5		
leptocylin minimus						3	10		
leptocylin mediterraneu					12				
cyclotella caspia		1							
skeletonem costatum	14							5	
thalassios spp.	1	1				*	4		
thalassios sp.1					3				
thalassios anguste–line		1	1	1	*	1	2	*	
thalassios nordenskiold	5	1		*	*	1	3		
thalassios pacifica	1		*		*		11		1
thalassios eccentrica /symmetrica				*		1			
thalassios pseudonana	173	242		128		168	243	809	1009
thalassios mendiolana				*					
thalassios conferta	24	19	5	5	54	19	33		6
coscinodis spp.			*		*		2		
lauderia borealis	4	3		*	*	12	34		
actinoptyc senarius				*					
asterompha sp.1	2		1	1		1			

Continued	6–7	8–6	10–5	12–8	14–9	15–5	18–8	20–5	23–7
biddulphi longicruris							2		
eucampia zoodiacus	123	42	*	1	1		152		
cerataulin pelagica	35	4			1	20	23		
ditylum brightwellii	*					*	*		
chaetocero sp.m							3		
chaetocero affine					2				
chaetocero boreale							2		
chaetocero compressum					4				
chaetocero convolutum /concavicorn	1	2	1	*	2	3	10	1	1
chaetocero constrictum /vanheurckii	328	18			14	272	484		
chaetocero debile	1098	154	2	17	4	1714	2642	2	1
chaetocero diadema	2				12	10	25		
chaetocero didymum	8	1			1	9	87		1
chaetocero filiforme	12	14	2	2		1	125	1	1
chaetocero laciniosum		2		*	4	8			
chaetocero lorenzianum	13	5		1	2	20	99		
chaetocero pelagicum				*					
chaetocero pseudocrinit	8	2		2	1				
chaetocero radicans	22	4				5	3		
chaetocero septentriona	8	*				7		*	
chaetocero simile			1	*					
chaetocero sociale	41	19	1	*	1	17	74	1	3
rhizosolen alata f.alata					3				
rhizosolen alata f.gracillima					1				
rhizosolen delicatula		1	*	1		1	1		
rhizosolen fragilissima				*	*		*	*	*
rhizosolen fragilissima v.1			1		4				1
rhizosolen hebetata f.semispina					*				
rhizosolen setigera	9					2	3	*	
rhizosolen stolterfothi	15	1	1	*	3	12	16	2	3
asterionel glacialis	1	*		1		4	11		

Continued	6–7	8–6	10–5	12–8	14–9	15–5	18–8	20–5	23–7
thalassiot frauenfeldii					*				
thalassion bacillaris			*		1	1			
thalassion nitzschoides	1	1	1	*	*	8	12	6	1
licmophora sp.1									*
naviculace spp.				*	2				
tropidonei lepidoptera				*					
amphora spp.			1	*	*				
nitzschia americana	112	25	1	1		96	456	10	5
nitzschia closterium			*		1			*	*
nitzschia closterium v.striatula		1	1	*				*	1
nitzschia cylindroform	7		10	4	895	5		1	136
nitzschia delicatissim	3		4	1	27			3	4
nitzschia longissima	4	2	*	1	3	5	58	2	*
nitzschia pseudodelica	1				4			*	
nitzschia seriata	29	20	26	4	3	44	41		10
nitzschia subcurvata					91	2			
nitzschia subfraudulen /fraudulen					143				
nitzschia subpacifica					12				
nitzschia turgiduloide /turgidula					41	1			1
cylindroth fusiformis		1	*	*	*			*	
tetraselmi spp. /pyramimonas	17	37	1	3		2	34	10	102
pterosperm spp. /pachysphaer				*					
eutreptiel spp.		1	1	2					
prorocentr balticum			1	1			4		
prorocentr gracile						2			
dinophysis spp.		*				*	*		
gonyaulax rugosum						1			
gymnodiniu spp.	19	9	7	20	81	17	19	3	11
katodinium rotundatum			*	4				1	9
gyrodinium spp.	4	4	3	7	48	5	6	3	6
peridiniac spp.	1	6	*	1		3		*	

Continued	6–7	8–6	10–5	12–8	14–9	15–5	18–8	20–5	23–7
ceratium spp.	1	*			*				
heterosigm akashiwo			*			2		2	
cryptomona spp. 5–10	84	38	10	13	28	16	19	29	353
cryptomona spp. 11–20	71	46	13	43	5	31	155	34	25
mesodinium rubrum	8	17	1	2		2	6	1	1

CRUISE 81–07

Station	26–8	29–7	31–5	33–8	34–7	35–7	36–8	38–8	40–8
Taxon									
ochromonas spp.	10	18	17	19	83	10	25	218	58
dinobryon suecicum		3			1				
dictyocha speculum					1		1		1
apedinella spinifera		1			1	2	*		
meringosph mediterranea		2			1	*			
imantonia rotunda	926	143	101	367	604	209	165	2263	487
corymbellu aureus	9				1	20	1		
leyanella arenaria	59	139	202	827	884		52		
leptocylin danicus		1			*	18			1
leptocylin minimus						2			
leptocylin mediterraneu								4	3
skeletonem costatum		1	1				*	4	1
thalassios spp.			*				*		
thalassios sp.1							*		
thalassios rotula							*		
thalassios anguste–line		*	*		*	1			
thalassios nordenskiold		*			*				
thalassios pacifica					*	2	*	1	
thalassios eccentrica /symmetrica									*
thalassios pseudonana	406	72	118		24	16	482		
thalassios conferta	31	7	4	9	19	12	5	16	15
coscinodis spp.									*
lauderia borealis		*			1	15			
asterompha sp.1		*					*		
eucampia zoodiacus						46			*
cerataulin pelagica						10		1	
chaetocero affine								3	1
chaetocero affine v.willei									1

Continued	26–8	29–7	31–5	33–8	34–7	35–7	36–8	38–8	40–8
chaetocero atlanticum								1	1
chaetocero compressum					1	8		5	5
chaetocero convolutum /concavicorn	1			*	*	14	1	1	
chaetocero constrictum /vanheurckii						418	2	6	4
chaetocero debile		*	*		13	1337	*	3	7
chaetocero diadema						10			4
chaetocero didymum					1	10		2	3
chaetocero filiforme	1	1	1	1	1	15	1	1	
chaetocero laciniosum									1
chaetocero lorenzianum						19		9	*
chaetocero pelagicum								17	3
chaetocero pseudocrinit									1
chaetocero radicans			*						
chaetocero septentriona						3			
chaetocero sociale		*	1		1	129		15	2
chaetocero subtile						2			
rhizosolen alata f.alata						*		2	1
rhizosolen alata f.gracillima								*	
rhizosolen delicatula					*	10			
rhizosolen fragilissima						1		1	*
rhizosolen fragilissima v.1	1	*			*	*		5	6
rhizosolen setigera						*			
rhizosolen stolterfothi	1	*	1		1	22	*	1	1
rhizosolen styliformis v.styliformi									*
thalassiot longissima									*
thalassion bacillaris								1	2
thalassion nitzschoides		1	1		1	7	2	3	3
nitzschia americana	1	3	3	1	2	581	1	6	1
nitzschia closterium			*		*			1	
nitzschia closterium v.striatula	5		*	3	2			2	1
nitzschia cylindroform	274	84	14	861	86	10	3	406	79

Continued	26–8	29–7	31–5	33–8	34–7	35–7	36–8	38–8	40–8
nitzschia delicatissim	4	1	*	*	1	3	1	13	10
nitzschia longissima		*	1	1	*	6	*	2	
nitzschia pungens					*		*		
nitzschia seriata	44	54	1	1	15	123	1	2	1
nitzschia subcurvata		*	*		1			34	60
nitzschia subfraudulen /fruadulen								44	7
nitzschia subpacifica								15	13
nitzschia turgiduloide /turgidula		1			1		1	40	8
cylindroth fusiformis			*				*		
tetraselmi spp. /pyramimonas	23		1	*	*	2	12		
pterosperm spp. /pachysphaer				*					
eutreptiel spp.				*					
prorocentr balticum				*			1		
prorocentr gracile	1						*		
dinophysis spp.									
gymnodiniu spp.	20	16	4	8	14	4	12	35	38
katodinium rotundatum	11	12	1	4	4	3	3		1
gyrodinium spp.	10	11	2	4	8	2	4	197	131
peridiniac spp.				*	1	4		*	
ceratium spp.	*					1	*		*
heterosigm akashiwo		*		1	1		1		
cryptomona spp. 5–10	386	56	63	362	302	5	56		4
cryptomona spp. 11–20	52	35	2	6	28	3	13		1
mesodinium rubrum		*	*			20	*		

CRUISE 81–07

Taxon	Station 41–8	43–8
ochromonas spp.	229	32
dictyocha speculum	5	
apedinella spinifera		*
imantonia rotunda	1322	260
leyanella arenaria	322	177
leptocylin danicus	4	*
cyclotella caspia		*
skeletonem costatum		1
thalassios spp.	*	
thalassios pacifica	1	*
thalassios pseudonana	163	149
thalassios conferta	14	1
lauderia borealis	7	*
biddulphi longicruris	*	
cerataulin pelagica	6	*
chaetocero compressum		*
chaetocero convolutum /concavicorı	10	*
chaetocero constrictum /vanheurckii	258	*
chaetocero debile	654	1
chaetocero diadema	4	*
chaetocero didymum	9	*
chaetocero filiforme	46	1
chaetocero lorenzianum	6	*
chaetocero pseudocrinit	7	*
chaetocero sociale	111	*
rhizosolen delicatula	*	*
rhizosolen fragilissima		*
rhizosolen fragilissima v.1		*

Continued	41–8	43–8
rhizosolen hebetata f.semispina	2	
rhizosolen stolterfothi	16	*
asterionel glacialis	1	
thalassion nitzschoides	2	*
nitzschia americana	13	*
nitzschia closterium v.striatula	124	
nitzschia cylindroform	636	
nitzschia delicatissim	4	*
nitzschia longissima	1	*
nitzschia seriata	6	*
nitzschia subcurvata		*
tetraselmi spp. /pyramimonas		5
eutreptiel spp.	*	*
gymnodiniu spp.	54	1
katodinium rotundatum	20	4
gyrodinium spp.	19	1
peridiniac spp.		*
heterosigm akashiwo		1
cryptomona spp. 5–10	65	38
cryptomona spp. 11–20	80	7
mesodinium rubrum	32	*

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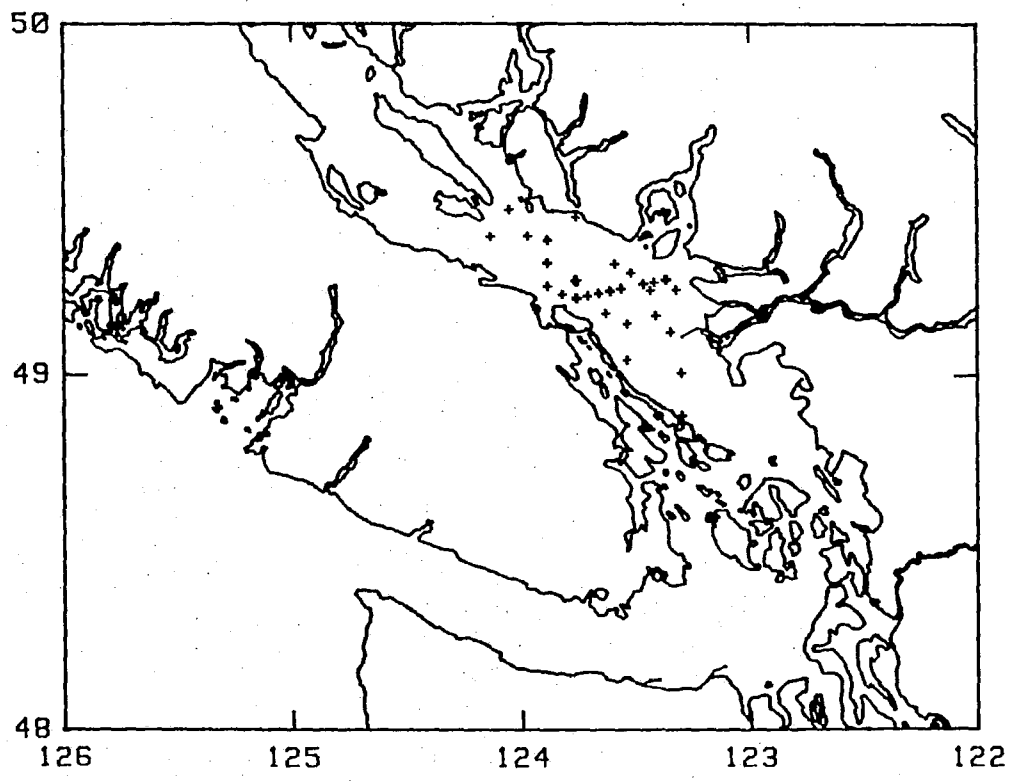
CRUISE 82–01

17 – 20 May 1982

Area of operations: Strait of Georgia

Vessel: C.S.S. Vector



CRUISE 82–01

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
1–1/5	17 May 82	49 16.0	123 45.7	10.0	10.7	28.50	0.9			
1–6/10		49 16.0	123 45.7	5.0	11.5	8.87	1.4			
2–2		49 16.0	123 45.7							
2–5		49 16.0	123 45.7							
4–2	18 May 82	49 16.2	123 22.0	200.0	8.7	30.78		27.0	2.47	50.3
4–6		49 16.2	123 22.0	72.5	8.4	30.11		16.1	1.68	36.3
4–10		49 16.2	123 22.0	1.4	12.6	19.30	1.2	7.1	0.72	43.5
6–10		49 15.4	123 27.8	7.1	11.0	28.33	0.4	12.2	1.58	29.2
8–10		49 14.6	123 33.7	4.0			1.9	5.6	0.93	42.4
9–2		49 14.2	123 36.6	14.7	10.4	28.68	0.1			
9–5		49 14.2	123 36.6	5.7	11.5	28.21	1.8			
10–10		49 13.8	123 39.6	7.2	10.9	28.45	0.4	10.3	1.52	26.8
12–10		49 13.0	123 45.4	7.7	9.6	28.76	0.2	15.0	1.84	29.9
13–3	19 May 82	49 13.0	123 45.4	17.3	9.6	28.74	0.2	29.1	2.35	47.6
13–10		49 13.0	123 45.4	5.5	10.5	28.49	0.5	11.8	1.48	27.6
14–10		49 13.4	123 42.5	4.7	11.0	28.51	0.2	10.5	1.58	26.2
17–10		49 14.6	123 33.7	6.7	11.7	27.97	0.6	6.8	1.12	23.9
19–10		49 15.4	123 27.8	6.1	13.0	27.13	1.0	8.2	1.30	28.7
20–3		49 15.8	123 24.9	5.3	11.4	26.20	1.4			
21–10		49 16.2	123 22.0	5.0	10.3	26.95	0.4	20.2	2.10	31.2
22–10	20 May 82	49 15.0	123 53.0	8.1	11.7	27.96	0.2	13.8	1.60	28.1
23–3		49 19.0	123 53.0	9.5	9.8	28.76	0.3	13.6	1.69	29.9
23–6		49 19.0	123 53.0	5.1	12.3	27.36	1.7	1.0	0.76	29.9
24–10		49 23.0	123 53.0	3.9	12.7	27.03	1.2	8.4	1.37	30.0
25–10		49 23.0	123 53.0	8.8	10.3	28.60	0.3	13.7	1.69	40.0
U17/0300	17 May 82	48 53.1	123 17.7	0.0	12.3	27.66	1.1	11.3	1.37	31.3
U17/0400		49 00.3	123 18.0	0.0	11.6	14.57	0.4	8.0	1.29	77.8
U17/0500		49 07.2	123 20.7	0.0	13.4	13.41	2.1	6.0	0.69	59.3
U17/0600		49 14.4	123 19.2	0.0	13.5	15.50	2.9	5.9	0.73	57.4
U17/0700		49 10.1	123 24.6	0.0	13.2	15.08	1.4	8.0	0.78	59.0
U17/0800		49 02.5	123 32.1	0.0	12.8	15.77	0.8	9.3	1.12	73.1
U17/0900		49 08.7	123 32.2	0.0	12.5	15.62	0.8	6.3	0.77	55.5
U17/1000		49 17.4	123 31.2	0.0	13.2	18.17	2.2	6.9	0.62	42.9
U17/1100		49 18.9	123 35.4	0.0	13.4	19.86	2.2	6.6	0.65	49.7

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
U17/2200	17 May 82	49 27.0	123 45.5	0.0	13.4	25.75	2.0	9.5	1.97	30.7
U17/2300		49 23.8	123 58.1	0.0	13.4	24.80	1.2	4.6	0.72	38.3
U18/0000	18 May 82	49 23.6	124 07.9	0.0	13.2	25.55	1.5	4.8	0.73	34.8
U18/0100		49 28.3	124 02.9	0.0	13.5	27.56	1.9	4.8	0.96	29.3
U18/0300		49 13.6	123 49.1	0.0	12.7	27.88	1.1	7.8	1.13	24.7
U18/0400		49 10.4	123 37.7	0.0	13.2	18.55	1.2	14.3	0.81	54.6
U18/0500		49 14.3	123 26.0	0.0	13.7	19.21	1.5	6.3	0.71	50.5

CRUISE 82–01

Taxon / Station	1–1/5	1–6/10	2–2	2–5	4–2	4–6	4–10	6–10	8–10
ochromonas spp.	701	240	1076	101	76	134	734	12	328
imantonia rotunda	232	49	331	827	38	37	305	4	990
leyanella arenaria	238	159				9	8		
corethron criophilum	1	*	*	1				*	*
cyclotella caspia						9			
skeletonem costatum							16		
thalassios rotula			*						
thalassios pacifica									*
thalassios decipiens						*			
chaetocero septentriona							1		
thalassion nitzschoides							*		
nitzschia delicatissim		*		*			*		
tetraselmi spp. /pyramimonas					2	*	2	1	
pterosperm spp. /pachysphaer							1		1
eutreptiel spp.							*		
gymnodiniu spp.						1	16	5	1
gyrodinium spp.					3		1	3	1
cryptomona spp. 5–10		1288	545	316	302	458	3602	536	2294
cryptomona spp. 11–20	1146	3	7	56	64	233	262	8	215
mesodinium rubrum					*	*			

Cruise 82–01

Station	9–2	9–5	10–10	12–10	13–3	13–10	14–10	17–10	19–10
Taxon									
ochromonas spp.	28	128	1180	98	252	1231	625	694	821
imantonia rotunda	6	1408	174	50	64	269	149	202	225
leyanella arenaria			11			20			
corethron criophilum			*		*	1		*	1
stephanopy turris						*			
cyclotella caspia	1								
skeletonem costatum						4			
thalassios rotula						1			
thalassios angstii						*			
thalassios nordenskiold						2			
thalassios pacifica						*			
thalassios decipiens						*			
thalassios conferta						*			
thalassios leptopus						*			
chaetocero compressum						3			
chaetocero convolutum /concavicorn						1			
chaetocero debile						1			
chaetocero laciniosum						*			
chaetocero lorenzianum						*			
chaetocero radicans						3			
chaetocero sociale						1			
chaetocero subtile						8			
rhizosolen delicatula						*			
rhizosolen fragilissima						1			
rhizosolen fragilissima v.1						*			
fragilaria spp.						*			
nitzschia delicatissim						19			1
nitzschia granii v.curvata						*			

Continued	9–2	9–5	10–10	12–10	13–3	13–10	14–10	17–10	19–10
nitzschia lineola						*			
nitzschia longissima						1			
nitzschia seriata						*			
tetraselmi spp. /pyramimonas	2								
gymnodiniu spp.	5		1	5	2	12	2	1	9
gyrodinium spp.			1	11	3	2	*		10
cryptomona spp. 5–10	48	666	1026	166	257	776	397	722	778
cryptomona spp. 11–20	14	17	29	19	5	28	3	6	10
mesodinium rubrum									*

CRUISE 82–01

Station	20–3	21–10	22–10	23–3	23–6	24–10	25–10
Taxon							
ochromonas spp.	848	174	437	868	248	632	211
imantonia rotunda	212	168	412	175	1550	215	70
corethron criophilum	1	*				*	*
skeletonem costatum		*					
thalassios rotula		*					
thalassios angstii		*					
thalassios pacifica		*					
thalassios decipiens		*					
thalassios leptopus		*					
chaetocero convolutum /concavicom			*				*
fragilaria spp.	*						
thalassion nitzschoides		*					
nitzschia delicatissim		*					
nitzschia lineola		*					
nitzschia longissima		*					
gymnodiniu spp.	2	9	8	5	1	2	1
gyrodinium spp.	1	1	9	1			1
cryptomona spp. 5–10	980	110	213	496	1351	618	121
cryptomona spp. 11–20	90	147	18	3	143	29	4

CRUISE 82–01

Taxon / Station	U17/0300	U17/0400	U17/0500	U17/0600	U17/0700	U17/0800	U17/0900	U17/1000	U17/1100
oscillator spp.			39		8	8	10		
ochromonas spp.	280	78	1334	1585	493	429	59	2	114
apedinella spinifera			17	30	23	3		17	9
imantonia rotunda	1683	26	935	5540	158	219	246	10	1357
skeletonem costatum	1	1	22	*	8	4	5	275	
thalassios rotula	*					*	*	*	*
thalassios angstii					*	*	*	*	*
thalassios nordenskiold				*					
thalassios pacifica	*	*	*	*	*	*	*	*	*
thalassios conferta						*			
coscinodis spp.			*	*					
coscinodis granii				*					
cerataulin pelagica							*		
chaetocero sp.gi					*				
chaetocero debile					*				
chaetocero simile								*	
fragilaria spp.							*		*
synedra acus		1	2		*	1	*		
asterionel formosa		*				*	*	*	
thalassion nitzschoides	*	*	*	*	*		*	*	
nitzschia delicatissim	3				*	*	*	*	
nitzschia granii v.curvata						*			
nitzschia longissima						*	*	*	
ankistrode spiralis									*
tetraselmi spp. /pyramimonas			5	11	5	1		13	
eutreptiel spp.			*						
dinophysis spp.			*						
gymnodiniu spp.			1	27	7			1	

Continued	U17/0300	U17/0400	U17/0500	U17/0600	U17/0700	U17/0800	U17/0900	U17/1000	U17/1100
katodinium rotundatum					1	1		1	
peridiniac spp.			2					1	
cryptomona spp. 5–10	1505	44	4993	4925	912	1213	664	987	2508
cryptomona spp. 11–20	245	90	1186	2565	372	438	211	976	1283

CRUISE 82–01

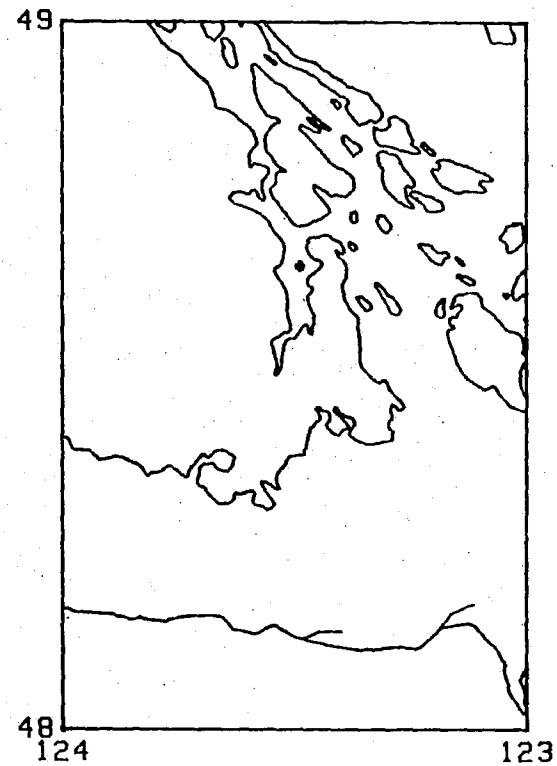
Taxon / Station	U17/2200	U17/2300	U18/0000	U18/0100	U18/0300	U18/0400	U18/0500
ochromonas spp.	207	97	102	153	113	610	34
apedinella spinifera	1					1	
imantonia rotunda	962	481	734	467	757	701	12
corethron criophilum	*		*		*		
leptocylin danicus					*		*
skeletonem costatum					1	2	27
thalassios angstii					*	*	*
thalassios nordenskiold					*		
thalassios pacifica					*	*	1
chaetocero debile					*		
rhizosolen delicatula							*
thalassion nitzschoides						*	
nitzschia americana					*		
nitzschia delicatissim	*			*	3	*	
nitzschia granii v.curvata						*	
nitzschia lineola					*		
nitzschia longissima					*	*	*
nitzschia seriata					*		
tetraselmi spp. /pyramimonas						4	
eutreptiel spp.	*					*	
gymnodiniu spp.							1
cryptomona spp. 5–10	1113	666	1081	463	236	4549	4013
cryptomona spp. 11–20	261	165	63	102	78	400	167

CRUISE 82–PB

23 – 29 June 1982

Area of operations: Patricia Bay, Saanich Inlet

Vessel: Launch



CRUISE 82–PB

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
PB0	23 June 82	48 39.3	123 29.3	8.0	13.5		17.9	1.4	0.62	12.6
PB1		48 39.3	123 29.3	15.0	12.4		14.7	6.4	1.10	19.9
PB2	24 June 82	48 39.3	123 29.3	8.0			8.5	3.2	0.86	12.3
PB3		48 39.3	123 29.3	12.0			20.2	5.7	1.14	18.2
PB4	25 June 82	48 39.3	123 29.3	8.0			8.1	17.7	0.70	8.4
PB5		48 39.3	123 29.3	12.0			9.5	3.0	0.64	12.3
PB6	28 June 82	48 39.3	123 29.3	8.0			2.9	0.7	0.47	5.6
PB7		48 39.3	123 29.3	12.0			3.1	3.8	0.74	9.1
PB8	29 June 82	48 39.3	123 29.3	8.0	13.3		1.0	0.3	0.38	2.0
PB9		48 39.3	123 29.3	12.0	11.6		0.9	5.1	1.01	13.8

CRUISE 82–PB (Patricia Bay)

Station / Taxon	PB0	PB1	PB2	PB3	PB4	PB5	PB6
ochromonas spp.	70	12	758	77	80	16	47
dinobryon suecicum					9		
apedinella spinifera			1		10	6	2
meringosph mediterranea				1			
imantonia rotunda	372	370	108	536	283	89	188
detonula pumila	4	12		4	5	7	
leptocylin danicus	4		3			3	
skeletonem costatum	7736	857	826	958	3021	2888	522
thalassios aestivalis	12		23	3	1		
thalassios angstii		1					1
thalassios anguste–line					1		
thalassios conferta	21	8	1	23	1	6	10
thalassios eccentrica /symmetrica	*						
thalassios leptopus	2		3	1		4	
thalassios nordenskiold	38	8	4	21	6	4	1
thalassios pacifica	139	82	20	94	26	38	5
thalassios rotula	25	15	7	39	7	6	1
biddulphi longicruris					1		*
eucampia zoodiacus							1
cerataulin pelagica	1	6	1	1			
ditylum brightwellii		1					
chaetocero spp. cells					34		
chaetocero sp.gi							1
chaetocero affine	60	47		53	13	19	31
chaetocero affine v.willei	109	2		24	29	26	15
chaetocero compressum	1508	676	574	531	817	578	244
chaetocero convolutum /concavicorn	3	2	3		5	5	
chaetocero constrictum /vanheurckii	25	23	36	1	55	25	27

Continued	PB0	PB1	PB2	PB3	PB4	PB5	PB6
chaetocero debile	703	1002	359	755	40	185	31
chaetocero diadema	603	45	123	142	177	87	31
chaetocero didymum	25	8	6		32	4	31
chaetocero filiforme	1	119	8	1	5	3	2
chaetocero laciniosum	2	14	12	3	9	3	19
chaetocero lorenzianum				4	4	3	5
chaetocero radicans	452	89	115	47	221	109	21
chaetocero septentriona	65	49	80	179	20	12	6
chaetocero simile	2	3	6	18	8	6	12
chaetocero sociale	75	59	22	118	19	27	128
chaetocero wighami		21		41	2		4
rhizosolen delicatula	2		2	2		2	
rhizosolen stolterfothi	1		2	4			
asterionel glacialis	33	25	31	38	16	18	1
thalassion nitzschoides	4	5	3	11	10	3	1
pleurosigm acutum			*		*		
nitzschia americana	118	94	19	183	100	95	44
nitzschia bicapitata				2			
nitzschia closterium				1			
nitzschia delicatissim	283	136	8	24	6	129	57
nitzschia granii v.curvata				1			3
nitzschia lineola	1	6	7	6	41	12	8
nitzschia longissima	9	12	6	24	5	23	1
nitzschia pungens							*
nitzschia subfraudulen /fraudulen							1
nitzschia subpacifica	3	1	*	12	8	1	14
tetraselmi spp. /pyramimonas					2		
pterosperm spp. /pachysphaer					6		
eutreptiel spp.			*				
prorocentr balticum		*					
gymnodiniu spp.	9	8	9	9	6	6	16

Continued	PB0	PB1	PB2	PB3	PB4	PB5	PB6
gymnodiniu vitiligo	1	1	1	1	1	5	4
gyrodinium spp.	9	3	18	3	2	36	19
peridiniac spp.					1	1	2
heterosigm akashiwo	149	9	81	20	55	19	27
cryptomona spp. 5–10	107	31	115	123	60	51	96
cryptomona spp. 11–20	6	10	19	16	3	3	42
mesodinium rubrum							2

CRUISE 82–PB (Patricia Bay)

Taxon / Station	PB7	PB8	PB9
ochromonas spp.	224	254	93
dinobryon suecicum		23	
dictyocha speculum		3	
apedinella spinifera		256	
meringosph mediterranea		30	
imantonia rotunda	675	2268	1020
corymbellu aureus	60		
leptocylin danicus	8		
skeletonem costatum	8704	1060	1000
thalassios rotula	8	2	
thalassios angstii	10	6	
thalassios nordenskiold	10	2	
thalassios pacifica	164	11	6
thalassios conferta	85		30
thalassios leptopus	8		
chaetocero spp. cells			14
chaetocero affine	80		16
chaetocero affine v.willei	64		
chaetocero compressum	2156	84	153
chaetocero convolutum /concavicorı	8	4	
chaetocero constrictum /vanheurckii	126	14	4
chaetocero debile	370		40
chaetocero diadema	261		6
chaetocero didymum	48		3
chaetocero filiforme	14		
chaetocero laciniosum	12		
chaetocero lorenzianum	8	19	
chaetocero radicans	320		30

Continued	PB7	PB8	PB9
chaetocero septentriona	201		33
chaetocero simile	13	17	5
chaetocero simplex	10		
chaetocero sociale	12		10
asterionel glacialis	18		3
thalassion nitzschoides	7		
nitzschia americana	376	130	117
nitzschia delicatissim	610	143	140
nitzschia granii v.curvata	12		
nitzschia lineola	52	91	
nitzschia longissima	75	12	22
nitzschia pungens			4
nitzschia subpacifica	13	26	11
tetraselmi spp. /pyramimonas		34	
pterosperm spp. /pachysphaer		40	
eutreptiel spp.		2	
prorocentr balticum		3	
dinophysis spp.		2	
gymnodiniu spp.	35	227	141
gymnodiniu vitiligo	10	68	23
gyrodinium spp.	76	153	122
peridiniac spp.	12	10	
ceratium spp.		1	
heterosigm akashiwo	34	294	34
cryptomona spp. 5–10	218	302	46
cryptomona spp. 11–20	168	580	13
mesodinium rubrum	10		

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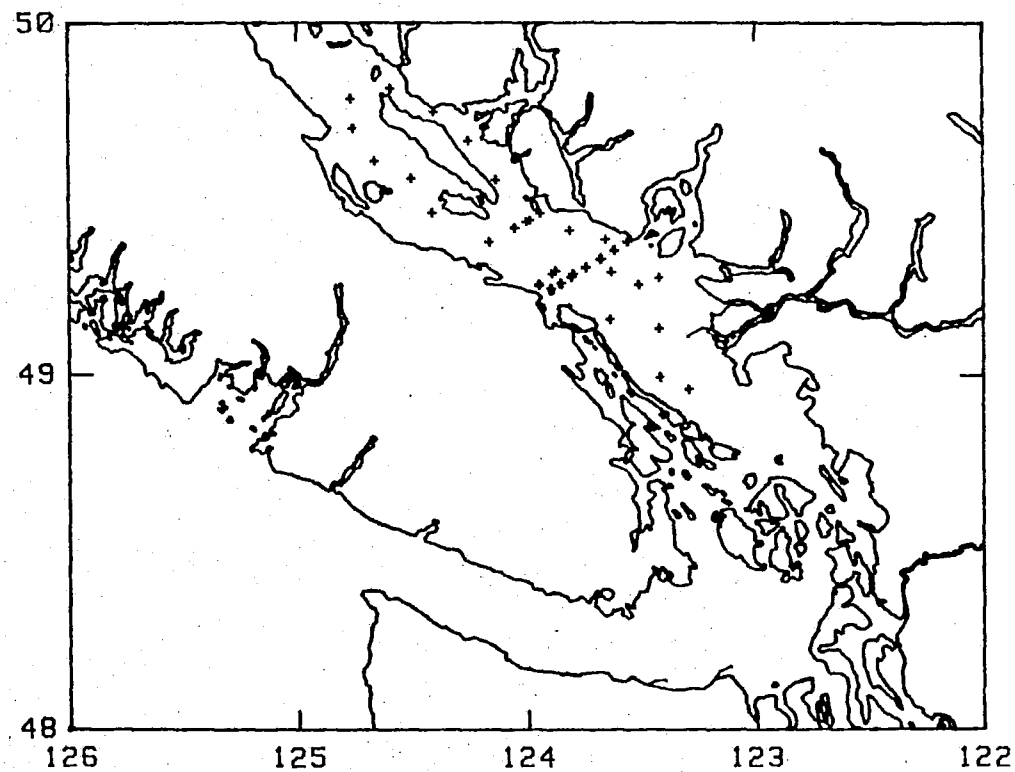
CRUISE 82–02

12 – 16 July 1982

Area of operations: Strait of Georgia

Vessel: C.S.S. Vector



CRUISE 82–02

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
1–10	13 July 82	49 14.5	123 53.4	10.5	13.0	26.69	5.0	8.1	0.94	22.8
2–10		49 15.5	123 50.8	9.0	14.1	25.58	4.5	11.1	1.14	26.3
3–1		49 16.5	123 48.2	10.1	15.1	24.09	3.6			
3–5		49 16.5	123 48.2	3.2	17.6	12.93	1.4	8.9	0.98	23.0
4–10		49 18.1	123 44.4	10.2	13.4	25.03	2.4	4.3	0.61	18.3
5–9		49 19.6	123 40.5	14.5	10.3	28.41	1.2	20.7	1.93	40.4
6–5		49 21.1	123 36.9	4.9	17.4	17.59	2.3	0.0	0.20	15.0
7–5		49 22.5	123 33.4	4.7	15.1	18.61	3.4	0.3	0.26	17.8
10–10	14 July 82	49 22.5	124 09.6	7.7	15.0	24.94	5.0	7.0	0.90	21.0
12–1		49 24.9	124 03.0	10.2	13.0	25.14	8.2	22.2	1.99	45.2
12–4		49 24.9	124 03.0	4.7	16.3	19.49	2.6			
13–10		49 26.3	123 59.0	18.5	9.6	29.26	0.4	20.6	1.83	44.3
14–9		49 27.4	123 56.3	7.0	10.7	28.34	3.2	16.1	1.67	39.2
19–1	15 July 82	49 19.6	123 40.5	11.6	11.4	26.57	3.2			
19–6		49 19.6	123 40.5	2.4	17.2	13.35	1.0			
20–5		49 21.1	123 36.9	9.3	11.4	26.78	9.8	16.1	1.56	32.6
21–6		49 22.5	123 33.4	5.6	15.0	20.42	1.7	3.1	0.40	24.0
22–6		49 22.5	123 33.4	4.9	16.1	17.24	2.0	0.7	0.36	22.4
23–9		49 19.6	123 40.5	5.1	16.5	20.19	1.1	3.3	0.46	16.1
24–10		49 18.1	123 44.4	11.2	12.4	26.74	4.5	15.4	1.51	35.3
25–9		49 14.5	123 53.4	9.9	14.4	25.62	6.6	1.4	0.29	4.3
26–9	16 July 82	49 15.0	123 56.6	12.0	14.3	25.80	5.3	6.6	0.64	13.6
U12/1900	12 July 82	48 57.5	123 17.5	0.0	17.8	8.78	3.0	10.1	1.16	56.2
U12/2000		48 59.5	123 25.0	0.0	17.6	18.24	0.6	4.6	0.85	59.3
U12/2100		49 07.8	123 25.2	0.0	17.6	9.96	1.9	2.1	0.85	48.2
U12/2200		49 16.4	123 25.3	0.0		13.99	2.7	0.1	0.39	30.1
U12/2300		49 15.2	123 30.5	0.0	19.2	17.38	3.8	1.2	0.38	25.3
U13/0000	13 July 82	49 09.3	123 38.0	0.0	19.4	16.34	1.8	0.8	0.26	16.9
U13/0100		49 17.4	123 37.8	0.0	19.7	9.76	3.6	0.0	0.36	25.1
U13/0200		49 23.0	123 39.2	0.0	19.7	11.84	3.8	0.0	0.37	19.5
U13/0300		49 17.0	123 47.8	0.0	19.4	9.34	3.5	0.1	0.38	21.4
U13/0400		49 17.6	123 52.4	0.0	18.8	10.21	3.6	0.1	0.38	24.0
U13/0500		49 17.1	123 53.2	0.0	19.5	10.70	3.1	0.1	0.37	21.4
U13/0600		49 15.2	123 56.6	0.0	19.2	15.17	1.8	23.1	0.34	14.3

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
U13/2000	13 July 82	49 24.5	123 48.6	0.0	18.8	11.45	2.8			
U13/2100		49 26.0	124 00.0	0.0	18.2	13.97	2.4	0.8	0.37	16.0
U13/2200		49 33.2	124 07.9	0.0	16.7	20.50	3.9			
U13/2300		49 39.8	124 15.1	0.0	18.6	15.56	3.3	0.4	0.34	16.8
U14/0000	14 July 82	49 44.9	124 24.1	0.0	18.3	15.49	4.4	13.4	0.34	13.6
U14/0100		49 48.8	124 35.3	0.0	17.0	15.86	2.1	0.3	0.32	13.4
U14/0200		49 47.1	124 45.8	0.0	17.8	20.23	2.5	0.0	0.31	5.8
U14/0300		49 42.0	124 45.2	0.0	17.4	21.47	2.0	0.2	0.30	4.1
U14/0400		49 36.4	124 39.5	0.0		22.18	2.1	0.0	0.30	3.0
U14/0500		49 33.4	124 30.0	0.0	16.9	23.79	6.3			
U14/0600		49 27.5	124 24.5	0.0	17.0	23.76	4.2			

CRUISE 82–02

Taxon / Station	1–10	2–10	3–1	3–5	4–10	5–9	6–5	7–5	10–10
ochromonas spp.	23	60	13	45	10	7	33	114	7
dinobryon suecicum								9	
dictyocha speculum	*	*							*
apedinella spinifera				1					
meringosph mediterranea			1						
imantonia rotunda	3	7	266	467	89	80	1072	1733	69
leyanella arenaria									11
corethron criophilum		*							
detonula pumila	3	4	1						1
leptocylin danicus	15	9	26	1	1	*			12
leptocylin minimus		1	1	1	6		1		
stephanopy nipponica	1								
cyclotella caspia	155	372	325	2462	1049	775	4583	5290	31
skeletonem costatum	858	314	21	7	1539	47			4
thalassios rotula	26	30	15	5	10	2	5	1	6
thalassios angstii		*		2	3	1	1	*	*
thalassios anguste–line					*				
thalassios aestivalis	2	4							
thalassios baltica			*						
thalassios nordenskiold	8	8	2	1	6	1	1		1
thalassios pacifica	3	3	1	*	12	1	*	4	1
thalassios conferta	14	8	2	73	19	29		6	2
thalassios leptopus	2	1		1	1				
coscinodis spp.								1	
coscinodis granii		1		3	1		1	*	
eucampia zoodiacus	5	2	5						2
cerataulin pelagica			1	8	7	*	90	94	*
ditylum brightwellii	*		*		*				*

Continued	1–10	2–10	3–1	3–5	4–10	5–9	6–5	7–5	10–10
chaetocero spp. cells							6	22	
chaetocero sp.gi					1				
chaetocero affine	84	75	67	1	1				263
chaetocero affine v.willei	74		51		1				
chaetocero compressum	68	23	10		2	1			5
chaetocero convolutum /concavicorn			*						
chaetocero constrictum /vanheurckii	3	3	1		*				14
chaetocero debile	4	12	43		4	2			25
chaetocero decipiens		1	2						
chaetocero diadema	1	1	1		1				
chaetocero didymum	1	1	2						1
chaetocero filiforme			3	13			4		
chaetocero laciniosum		6	1		1				
chaetocero lorenzianum	20	3	2		3				2
chaetocero pelagicum	3	2							
chaetocero radicans	1				1	3			
chaetocero rostratum									1
chaetocero septentriona	8	4	5		1				
chaetocero simile		1							
chaetocero simplex		*							
chaetocero sociale	59	12	22	7	2	2			
chaetocero subtile				7	6		1	85	4
chaetocero vistulae	2		1		1				
chaetocero wighami	1								
rhizosolen delicatula	2	4	3	8	5		10	14	
rhizosolen fragilissima	1		1						*
rhizosolen fragilissima v.1					1				
rhizosolen hebetata f.semispina		1							
asterionel glacialis	5	3			3	1			1
thalassion nitzschoides	10	19	1	4	13	2	9	9	2
pleurosigm acutum		1							

Continued	1–10	2–10	3–1	3–5	4–10	5–9	6–5	7–5	10–10
nitzschia americana	5	1			3	1			3
nitzschia delicatissim	26	12		*	23	27			13
nitzschia lineola	14	3	45	*	6	4			1
nitzschia longissima	22	13	3		17	4			24
nitzschia pseudodelica	1	2			1	1			
nitzschia pungens		1	3						
nitzschia subfraudulen /fraudulen			1						
nitzschia subpacifica									3
nephroselm spp. /bipedinomon				3				125	
tetraselmi spp. /pyramimonas				27		4	29	6	
cymbomonas spp.								25	
pterosperm spp. /pachysphaer				12		5	2	6	
eutreptiel spp.					2		13	36	
prorocentr balticum				1			2		
prorocentr gracile				*			1	2	
dinophysis spp.			*	1			4	2	
gymnodiniu spp.		5	6	17	19	14	63	38	6
gymnodiniu vitiligo			40	39	13	8	84	540	
katodinium rotundatum		5		8	54	14	105	72	4
gyrodinium spp.		11	18	9	14	6	4	7	22
peridiniac spp.							38	31	
heterocaps triquetra					*		1	6	
gonyaulax spp.									*
heterosigm akashiwo			2				5		
cryptomona spp. 5–10	26	65	63	35	41	11	30	17	43
cryptomona spp. 11–20	17	14	23	56	50	26	62	15	13
mesodinium rubrum				*					

CRUISE 82–02

Station	12–1	12–4	13–10	14–9	19–1	19–6	20–5	21–6	22–6
Taxon									
anabaena spp.								4	
ochromonas spp.	5	3		6	46	7	35	8	19
dictyocha speculum	1								
imantonia rotunda	22	3	2	36	656	384	169	58	115
leyanella arenaria	204	178			41	38	195	19	83
detonula pumila	7	4		4	*			1	
leptocylin danicus	5	5		3	*	1	3		1
leptocylin minimus					1				
cyclotella caspia	482	125	145	490	1425	3705	1153	1493	1243
skeletonem costatum	1079	313	51	698	210		2018	4	
thalassios rotula	23	20	*	109	23	3	70	8	9
thalassios angstii		2		2		1		1	1
thalassios aestivalis					1	*	1	*	*
thalassios nordenskiold	1	2		2	2	*	5	*	*
thalassios pacifica	1	*		4	4	1	7	*	2
thalassios decipiens					4		10	2	2
thalassios conferta	13	12	2						
thalassios leptopus					1		1		
coscinodis granii	4	1	1	1		1			
eucampia zoodiacus	1						2		
cerataulin pelagica		2	1		3	5	2	4	51
chaetocero affine	125	32		8			18		4
chaetocero affine v.willei								6	6
chaetocero compressum	5			6	7		25		
chaetocero constrictum /vanheurckii		1	*	1			3		
chaetocero debile		2	1	12	6		66		
chaetocero didymum	1			2	3		23		
chaetocero filiforme		4			4		5		104

Continued	12–1	12–4	13–10	14–9	19–1	19–6	20–5	21–6	22–6
chaetocero laciniosum		*	*						
chaetocero lorenzianum	2			2	1		9		1
chaetocero radicans				2	3		19		
chaetocero septentriona	19	6			6		11		1
chaetocero simile								1	
chaetocero sociale			*	3	7		134		3
chaetocero subtile	9	5					5	8	12
rhizosolen delicatula	2	2		2	1	10	7	11	13
rhizosolen fragilissima					*				1
asterionel glacialis				3	5		23	*	
thalassion nitzschoides	9	1	1	7	9	4	20	4	6
nitzschia americana		2		1			5		
nitzschia delicatissim	1	2	*	15	14		134		
nitzschia granii v.curvata					2				
nitzschia lineola	1				6		15	2	4
nitzschia longissima	10	1	1	15	19		47		
nitzschia pseudodelica		*		1	1				
nitzschia pungens		*	*	1					
nitzschia subfraudulen /fraudulen		2							
nitzschia subpacifica	1	1					1		
tetraselmi spp. /pyramimonas	18	73			22	25	13	27	12
pterosperm spp. /pachysphaer	6	17							
eutreptia spp.									
eutreptiel spp.								1	
prorocentr balticum					3	1		7	1
prorocentr gracile		4							
dinophysis spp.	*	*							
gymnodiniu spp.		2				6		1	4
katodinium rotundatum	10	112	2	135	36	129	57	29	60
gyrodinium spp.	13	7	3	5	30		12	10	7
heterocaps triquetra	16	13	13	20	23	5	118	3	5
	*							1	

Continued	12–1	12–4	13–10	14–9	19–1	19–6	20–5	21–6	22–6
ceratium spp.						*			
heterosigm akashiwo	26				2			2	3
cryptomona spp. 5–10	109	97	5	222	94	13	282	96	73
cryptomona spp. 11–20	51	7	15	54	53	41	104	71	86
mesodinium rubrum	*	*			1			*	9

CRUISE 82–02

Taxon / Station	23–9	24–10	25–9	26–9
ochromonas spp.	70	127	226	292
dictyocha speculum			10	9
imantonia rotunda	555	1020	1710	1190
leyanella arenaria	215			
detonula pumila		2		18
leptocylin danicus		18	581	381
cyclotella caspia	2300	9324	595	151
skeletonem costatum	196	5650	72	36
thalassios rotula	17	50	19	61
thalassios angstii	7			
thalassios aestivalis		6		8
thalassios nordenskiold	6	44		27
thalassios pacifica	3	12	9	7
thalassios decipiens		50		
thalassios leptopus		8		
coscinodis granii		2		
eucampia zoodiacus	2	8	33	81
cerataulin pelagica	2	6		9
chaetocero affine	52	182	2255	1650
chaetocero affine v.willei	104	156	3055	4950
chaetocero compressum		141	17	
chaetocero constrictum /vanheurckii		104		
chaetocero debile	18	222		
chaetocero diadema		53		
chaetocero didymum		116	8	
chaetocero lorenzianum		26	8	
chaetocero radicans		26		
chaetocero rostratum	6	13	37	28

Continued	23–9	24–10	25–9	26–9
chaetocero septentriona		110		
chaetocero sociale	16	126	905	409
chaetocero subtile		27		
rhizosolen delicatula	12	2		30
rhizosolen fragilissima				20
asterionel glacialis	3	18		
thalassion nitzschoides	14	140	20	46
pleurosigm acutum		2		
nitzschia americana			19	
nitzschia delicatissim	10	504	4	
nitzschia granii v.curvata		38		7
nitzschia lineola	8	65		162
nitzschia longissima	4	351	55	80
nitzschia pungens			16	
nitzschia subfraudulen /fraudulen		51	91	42
tetraselmi spp. /pyramimonas	384		545	425
pterosperm spp. /pachysphaer	30			
dinophysis spp.	5		6	
amphidiniu spp.	1			
gymnodiniu spp.	736	206	1060	118
katodinium rotundatum	133	34	38	58
gyrodinium spp.	165	292	142	308
heterosigm akashiwo	20			
cryptomona spp. 5–10	520	460	910	128
cryptomona spp. 11–20	464	294	830	805
mesodinium rubrum	32	2	16	17

CRUISE 82–02

Taxon / Station	U12/1900	U12/2000	U12/2100	U12/2200	U12/2300	U13/0000	U13/0100	U13/0200	U13/0300
oscillator spp.	32		161	40					
anabaena spp.			8						
ochromonas spp.	2044		11	106	445	76	800	16	840
dinobryon divergens			8						10
dinobryon suecicum				22	37	8	12	108	184
apedinella spinifera	10			8					
imantonia rotunda	6132		13	6555	20290	2462	8436	9758	24510
detonula pumila				19		18			
leptocylin danicus					4	2			
leptocylin minimus				26	14	2			
cyclotella caspia	15850		6020	16930	33740	21160	35230	52900	45830
skeletonem costatum	94			144	132	192			20
thalassios rotula			3	118	82	112	2	22	14
thalassios angstii			1	25	18	26	*	43	6
thalassios nordenskiold					4				
thalassios pacifica				8		8			4
thalassios decipiens			1	3	2				5
thalassios conferta					33				8
coscinodis spp.					2	2	1		
coscinodis granii				3	2	5		1	
cerataulin pelagica	9		10	330	350	732	750		1380
ditylum brightwellii				1		2			
chaetocero spp. cells					264		204	64	148
chaetocero affine	12			18	12	4			12
chaetocero affine v.willei	14					50			
chaetocero decipiens				2					
chaetocero didymum						4			
chaetocero laciniosum				8	3	5			

Continued	U12/1900	U12/2000	U12/2100	U12/2200	U12/2300	U13/0000	U13/0100	U13/0200	U13/0300
chaetocero lorenzianum				3	2	31			
chaetocero simile	8			2	5				
chaetocero subtile	266			13	160	8			296
chaetocero wighami						8			
rhizosolen delicatula	20		25	176	48	146	53		146
fragilaria spp.	4								
synedra acus	1		5						
asterionel bleakelyi	5								
asterionel formosa			89	9	4				
thalassion nitzschoides		4	4	56	22	108	92	109	70
nitzschia granii v.curvata	13								
nitzschia lineola	8		1	36	26	49			
nitzschia longissima			1	5	13	2			
nitzschia subfraudulen /fraudulen				21		8			
carteria spp.	13					4			
ankistrode spiralis			9				10		20
ankistrode falcatus v.mirabilis			5						
nephroselm spp. /bipedinomon				198	740	8	2464	18	1520
tetraselmi spp. /pyramimonas	33			1590	2500	40	2324	1198	330
cymbomonas spp.				60	84	6	129	30	130
pterosperm spp. /pachysphaer				66	54	52	102	270	185
eutreptiel spp.	725			8	26		262	124	80
prorocentr balticum			12	5	64	33	7	4	
prorocentr gracile			1	2	26	948	23	5	
dinophysis spp.	1			1	6	2		23	
gymnodiniu spp.			53	92	2740	10	3940	1664	1020
gymnodiniu sanguineum						1		1	
gymnodiniu vitiligo				11	362	98	3584	1032	760
katodinium rotundatum			66	39	12010	26	3724	5426	3030
peridiniac spp.	182		13	16	92	316	66	24	
heterocaps triquetra	66			145	187	26	210	16	

Continued	U12/1900	U12/2000	U12/2100	U12/2200	U12/2300	U13/0000	U13/0100	U13/0200	U13/0300
gonyaulax spp.							2		
heterosigm akashiwo	280		4	10	89		88		4
cryptomona spp. 5–10	4620	202	195	935	4480	248	715	162	2490
cryptomona spp. 11–20	250	236	264	670	476	74	60	300	462
cryptomona ovata	228		6	105	130	172	296	11	262
mesodinium rubrum	234			7	123	57	4	192	

CRUISE 82–02

Station	U13/0400	U13/0500	U13/0600	U13/2000	U13/2100	U13/2200	U13/2300	U14/0000	U14/0100
Taxon									
ochromonas spp.	2464	605	2296	1040	384	348	49	50	255
dinobryon suecicum	55	73	126	31				14	660
dictyocha speculum					1	4			
apedinella spinifera					20	50			27
imantonia rotunda	16300	6703	25080	9576	3876	2782	4925	4879	4676
detonula pumila		18		7	28	28			
leptocylin danicus		22			161	118	4	27	22
leptocylin minimus		14			41	36	21	14	72
cyclotella caspia	40240	23260	70450	50840		8983	19060	21160	16530
skeletonem costatum		64	16		2289	278	74	905	278
thalassios rotula	10	134	46	30	92	174	46	93	32
thalassios angstii	6	18	50	28	10	68	21	50	55
thalassios anguste–line		2							
thalassios aestivalis					2	3			
thalassios nordenskiold		7		2	8	10		2	4
thalassios pacifica		10	4	9		8		9	1
thalassios decipiens	4								
thalassios conferta		28		7		2			
thalassios leptopus					2	2			
coscinodis spp.		1	6	1	1	3	2	1	
coscinodis granii		16	4	6	12	15	12	10	12
eucampia zoodiacus		3			2				
cerataulin pelagica	1770	324	1690	1765	93	52	317	21	4
ditylum brightwellii		1							
chaetocero spp. cells	395		560	24					
chaetocero sp.m					12	4			
chaetocero affine	18	28		5	110	87	17		
chaetocero affine v.willei		23			7342	12		31	

Continued	U13/0400	U13/0500	U13/0600	U13/2000	U13/2100	U13/2200	U13/2300	U14/0000	U14/0100
chaetocero compressum		22			21	12			
chaetocero constrictum /vanheurckii		6			10	3			
chaetocero debile		14				12			
chaetocero decipiens		6			10				
chaetocero diadema		3							
chaetocero didymum					6				
chaetocero filiforme					736	68	5	9	920
chaetocero laciniosum		8			4				
chaetocero lorenzianum		8			12	26	12	11	
chaetocero pelagicum	32	2				7			
chaetocero radicans						17			
chaetocero rostratum					2				
chaetocero septentriona					7	11			
chaetocero simplex									48
chaetocero sociale	13						4	3	
chaetocero subtile	282	59	366	31		25	50	5	
rhizosolen delicatula	222	45	88	38		23	79	84	34
rhizosolen fragilissima		1				2			
fragilaria spp.		*							
asterionel bleakelyi		4							
asterionel glacialis					2	9			
thalassion nitzschoides	86	114	172	114	70	57	62	65	22
pleurosigm acutum						1			
nitzschia americana					5	5			
nitzschia delicatissim		10			36	21		57	13
nitzschia granii v.curvata		5							
nitzschia lineola		176			51	48	5	6	12
nitzschia longissima		10			66	43	1	30	18
nitzschia pungens		16				1			
nitzschia subfraudulen /fraudulen		5			15	16		16	

Continued	U13/0400	U13/0500	U13/0600	U13/2000	U13/2100	U13/2200	U13/2300	U14/0000	U14/0100
carteria spp.		7							
nephroselm spp. /bipedinomon	750	12	280	126		10	210	212	
tetraselmi spp. /pyramimonas	396	118	615	290		75	904	576	136
cymbomonas spp.	560	63	390	224		12	146	60	184
pterosperm spp. /pachysphaer	232	39	266	162	274	250	244	272	224
eutreptiel spp.	28	6	20			14	135		2
prorocentr balticum	30				20	13	28		
prorocentr gracile		9		5		10	133	244	44
dinophysis spp.	9	2	2	5	20	22	53	79	18
gonyaulax rugosum				3					
gymnodiniu spp.	3140	504	1600	1060	1300	1747	1277	2804	1450
gymnodiniu sanguineum					2		1	2	
gymnodiniu vitiligo	454	183	560	260	15	132	180	145	66
katodinium rotundatum	1790	222	1680	535	196	290	536	142	160
gyrodinium spp.		6	151	52	30	106	10	9	104
peridiniac spp.			21		50	52	276	656	158
heterocaps triquetra	65	13	26	6	20	21	92	55	11
gonyaulax spp.					1		1		
ceratium spp.					*	12	*	1	
heterosigm akashiwo	157	25	56	47		18	12		
cryptomona spp. 5–10	990	93	1350	1020	4880	352	191	167	137
cryptomona spp. 11–20	256	143	392	695	7400	500	516	30	430
cryptomona ovata	280	66	290	28		20	91		
mesodinium rubrum	13		27		82		312	206	130

CRUISE 82–02

Station	U14/0200	U14/0300	U14/0400	U14/0500	U14/0600
Taxon					
ochromonas spp.	456		20	236	
dinobryon suecicum	340				
dictyocha speculum				1	
imantonia rotunda	4104	2160	536	2128	2380
corymbellu aureus	50				
detonula pumila	2				
leptocylin danicus		52	9	104	227
leptocylin minimus					7
cyclotella caspia	4256	2340	224	465	698
skeletonem costatum					9
thalassios rotula	44	32	23	30	77
thalassios angstii	10	8	6	3	10
thalassios nordenskiold			2	8	36
thalassios pacifica	4	2	1		5
coscinodis spp.		2			3
coscinodis granii		2		1	
eucampia zoodiacus				16	28
cerataulin pelagica	6				
ditylum brightwellii			*		
chaetocero affine	2092	1073	2336	6070	6220
chaetocero affine v.willei		460			
chaetocero compressum	56				
chaetocero lorenzianum		78	102		
chaetocero rostratum	6				
chaetocero septentriona		13			
chaetocero wighami	86				
rhizosolen delicatula	6	20	1	6	45
rhizosolen fragilissima				2	2
thalassion nitzschoides	12	6	3	11	13

Continued	U14/0200	U14/0300	U14/0400	U14/0500	U14/0600
nitzschia americana	6				
nitzschia delicatissim		2	2	10	80
nitzschia granii v.curvata			*	6	8
nitzschia lineola	31	44	10	20	49
nitzschia longissima		10			11
nitzschia pseudodelica					5
nitzschia pungens			4	12	19
nitzschia subfraudulen /fraudulen	2	12	4	18	29
nephroselm spp. /bipedinomon		118	52		
tetraselmi spp. /pyramimonas	13	23	60		
cymbomonas spp.	21	12		16	
pterosperm spp. /pachysphaer	160	155	26	73	
prorocentr gracile	30	10	1	8	23
dinophysis spp.	22	4		2	
cochlodini spp.			13	18	
gymnodiniu spp.	2360	860	500	5378	418
katodinium rotundatum				36	
gyrodinium spp.	112	296	10	200	11
peridiniac spp.	99	87	16	2	7
heterocaps triquetra	4		1	3	8
gonyaulax spp.			1		
ceratium spp.	2				
heterosigm akashiwo		13		10	15
cryptomona spp. 5–10	191	284	52	290	
cryptomona spp. 11–20	188	330	92	1290	15
cryptomona ovata			8	18	
mesodinium rubrum	156	50	16	2	3

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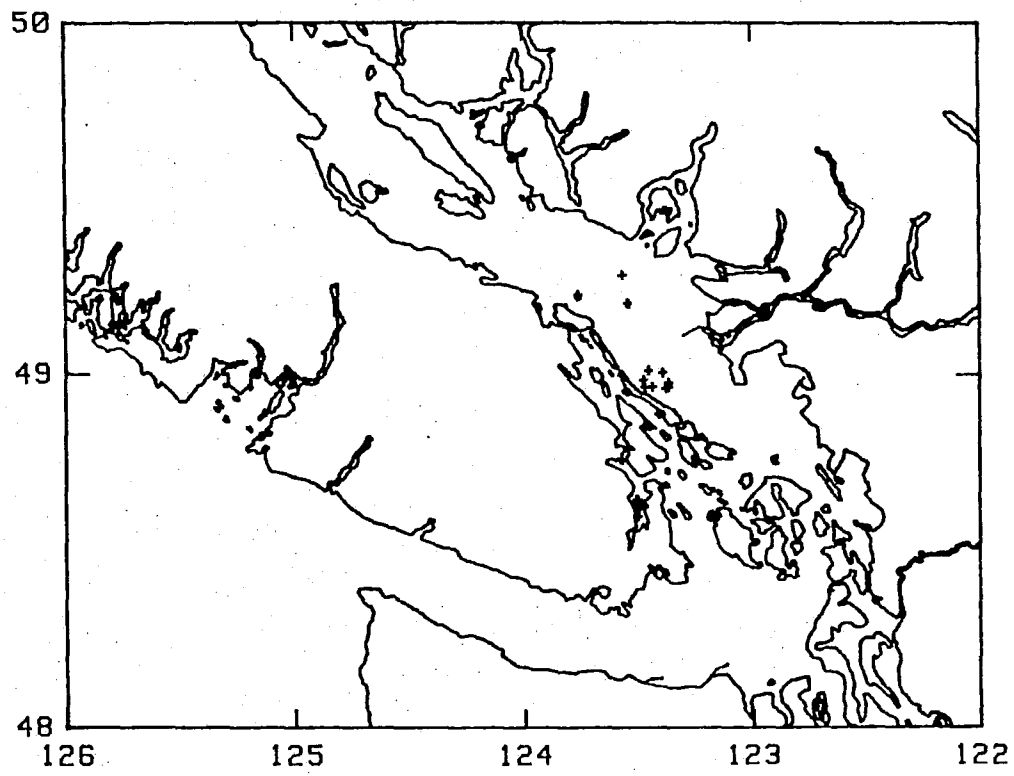
CRUISE 83–02

16 – 27 May 1983

Area of operations: Strait of Georgia and Saanich Inlet

Vessel: C.S.S. Vector



CRUISE 83–02

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
2–2	17 May 83	49 13.4	123 45.4	4.3			1.8			
11–10	20 May 83	49 16.8	123 33.7	7.2	9.8	27.59	2.0	14.4	1.19	29.2
12–9		49 12.0	123 32.4	5.9	13.2	25.47	1.6	0.4	0.49	22.1
15–1	23 May 83	48 37.0	123 30.0	15.0	10.4	29.02	4.8			
15–3		48 37.0	123 30.0	6.4	10.7	28.87	18.6	1.7	0.76	16.0
16–1		48 37.0	123 30.0	14.3	10.4	28.98	17.4	10.8	1.35	23.2
16–3		48 37.0	123 30.0	7.2	11.2	28.81	21.1	1.4	0.72	12.0
17–1		48 37.0	123 30.0	14.3	10.5	28.93	20.1	5.2	0.98	15.8
17–3		48 37.0	123 30.0	7.4	11.1	28.83	10.8	0.0	0.42	7.6
18–1	24 May 83	48 38.5	123 30.0	14.8	10.6	28.97	5.5	10.7	1.26	24.0
18–3		48 38.5	123 30.0	5.8	11.4	28.70		2.2	0.67	14.0
19–1		48 38.5	123 30.0	14.2	11.0	28.88	16.3	5.3	0.96	17.8
19–3		48 38.5	123 30.0	5.2	13.2	28.72	2.3	0.0	0.32	4.5
20–1		48 38.5	123 30.0	15.0	10.9	28.86	12.1	9.4	1.04	22.7
20–3		48 38.5	123 30.0	6.1	11.3	28.35	19.1	1.4	0.66	21.8
22–1	25 May 83	48 37.0	123 30.0	4.1	13.6	28.31	19.3	2.7	0.41	18.4
23–1		48 37.0	123 30.0	8.3	11.8	28.20	27.1	5.3	0.74	25.4
24–1	26 May 83	48 37.0	123 30.0	7.2	11.3	28.49	25.7	2.1	0.95	27.0
25–1		48 37.0	123 30.0	6.3	11.7	28.37	24.5	5.4	0.74	20.3
26–1		48 37.0	123 30.0	7.0	11.3	28.51	22.3	4.9	0.96	23.0
27–1		48 37.0	123 30.0	5.7	11.3	28.49	21.6	6.0	0.90	21.7
28–1		48 37.0	123 30.0	10.8	11.3	28.63	18.7	4.7	0.98	21.0
29–9		48 37.0	123 30.0	10.0	11.3	28.54	22.4	1.4	0.90	21.4
30–10		48 35.6	123 30.0	8.6	12.5	28.61		0.2	0.35	7.1
31–1		48 35.6	123 30.0	7.7	12.5	28.65		0.0	0.44	6.2
32–1	27 May 83	48 35.6	123 30.0	7.8	12.8	28.54	3.0	0.3	0.47	7.5
33–9		48 35.6	123 30.0	9.3	11.8	28.62	3.6	0.9	0.59	31.9
P3	18 May 83	48 47.7	123 25.9	3.9	12.8	23.28	1.8	3.6	0.62	38.9
P4		48 57.7	123 27.9	3.1	13.1	23.49	1.9	2.4	0.54	41.3
P5		48 58.9	123 28.3	2.7	13.2	23.97	1.7	9.2	0.64	29.6
P6	19 May 83	49 00.5	123 27.0	0.0			1.4	1.0	0.49	29.4
P7		49 00.1	123 23.3	0.0			1.3	3.8	0.58	33.6
P8		48 58.3	123 21.6	2.3	13.0	23.43	1.4	2.4	0.54	36.7
P9		48 57.4	123 22.4	3.0	13.1	23.61	2.1	8.0	0.51	17.0

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
P10	19 May 83	48 57.6	123 21.7	2.7	13.1	23.89	1.5	3.0	0.64	29.6

CRUISE 83–02

Taxon	Station 2–2	11–10	12–9	15–1	15–3	16–1	16–3	17–1	17–3
ochromonas spp.	206	675	370	470	1067	1816	1022	980	522
dictyocha speculum			2		9				
apedinella spinifera			8		227		9		9
imantonia rotunda				5814	12970	9534	7491	12650	999
detonula pumila			2	955	8399	2107	6020	5510	4131
leptocylin danicus				106	173	354	200	208	154
leptocylin minimus		3							
stephanopy nipponica								4	
skeletonem costatum		72	1248	273	19830	10300	14600	22380	14160
thalassios spp.				2	5				
thalassios sp.1			22				54		
thalassios rotula				2	9			8	36
thalassios anguste–line				28	23	9			
thalassios nordenskiold		2		4	9		9	12	36
thalassios pacifica			8	80	282	127	263	242	91
thalassios lineata				4					
thalassios eccentrica /symmetrica								10	
thalassios mendiolana								16	
thalassios conferta		10			23	23		8	18
cerataulin pelagica			20					8	
ditylum brightwellii					5				
chaetocero sp.gi			9					5	23
chaetocero compressum				234	1662	2229	2971	1980	3705
chaetocero convolutum /concavicorn				90	141	118	82	60	82
chaetocero constrictum /vanheurckii				84	663	100	218	338	136
chaetocero danicum			4						
chaetocero debile				1915	7355	4449	8090	7960	13580
chaetocero diadema				3	145	54	109	182	309
chaetocero didymum			4	18	682	282	127	182	163

Continued	2–2	11–10	12–9	15–1	15–3	16–1	16–3	17–1	17–3
chaetocero laciniosum			5	6	23	64	18	40	18
chaetocero lorenzianum				4	45		18	20	27
chaetocero pseudocrinit				18	220		18	60	45
chaetocero radicans			23	42	649	245	1584	312	1298
chaetocero septentriona			70						27
chaetocero simile				13	195	18	109	39	
chaetocero sociale					68	27	32	26	409
rhizosolen delicatula			36	6					
rhizosolen fragilissima			1	17			27	32	
rhizosolen fragilissima v.1		2	12						
rhizosolen stolterfothi				26	64	18	36	36	27
asterionel glacialis								4	
thalassion bacillaris				14	9	9	27	4	
thalassion nitzschoides			21	30		27		12	27
nitzschia americana				360	2243	826	767	860	531
nitzschia delicatissim		3		660	1642	1707	1589	1910	1416
nitzschia granii v.curvata		2						3	
nitzschia lineola					18				
nitzschia longissima		10	38	13	54			24	36
nitzschia pungens			3	2		9		5	
nitzschia seriata			2				14		14
cylindroth fusiformis			1	3			5		9
nephroselm spp. /bipedinomon								28	
tetraselmi spp. /pyramimonas					363		41		
halosphaer spp.		7							
eutreptiel spp.		3	2						
prorocentr balticum					32		14	17	
gymnodiniu spp.	12	285	8	145	141	45	36	155	54
gymnodiniu gracilentum		120		280	182	45	18	28	14
peridiniac spp.			20		41	18	27		
gonyaulax spp.			4						9

Continued	2–2	11–10	12–9	15–1	15–3	16–1	16–3	17–1	17–3
raphidophy sp.2					182			14	
heterosigm akashiwo						9			
cryptomona spp. 5–10	11720	7952	11740				136		
cryptomona spp. 11–20	672	428	3948		23		91		
mesodinium rubrum						5			

CRUISE 83–02

Taxon \ Station	18–1	18–3	19–1	19–3	20–1	20–3	22–1	23–1	24–1
ochromonas spp.	1400	3632	1589	550	1064	499	1044	1407	840
dictyocha speculum				8		5			
apedinella spinifera		59		26		204		32	
meringosph mediterranea				6					
imantonia rotunda	3584	4449	18310	1510	3612	908	1317	1771	6719
detonula pumila	1330	12390	5457	1014	2566	13950	18390	19160	9125
leptocylin danicus	104	64	100	48	90	127	209	109	173
paralia sulcata					10				14
stephanopy nipponica					15			14	14
skeletonem costatum	5590	34970	20070	4641	9360	35420	44260	39500	23790
thalassios spp.	3					5		5	
thalassios rotula	22				9	82	54	41	54
thalassios angulata								5	5
thalassios anguste–line	14					104	18		45
thalassios aestivalis				10			36		
thalassios nordenskiold		9				27			9
thalassios pacifica	166	336	154	20	174	554	581	645	418
thalassios lineata									5
thalassios mendiolana		45	154	4		18			
thalassios conferta	83	163	91		121	127	163	100	227
cerataulin pelagica	7				3	9	45	23	
chaetocero sp.gi	4				6			409	
chaetocero sp.m				2	3	9			
chaetocero compressum	401	3650	2279	2496	1880	1371	4177	1444	5666
chaetocero convolutum /concavicorn	14	173	109	18	22	91	54	45	18
chaetocero constrictum /vanheurckii	47	590	163	96	74	717	1094	590	681
chaetocero debile	846	2956	4540	1935	2400	9071	91160	6347	7446
chaetocero diadema	68	118	163	24	34	200	209	118	54
chaetocero didymum	72	163	45	42	65	182	427	218	254

Continued	18–1	18–3	19–1	19–3	20–1	20–3	22–1	23–1	24–1
chaetocero laciniosum	22	18	64	8		91	45		73
chaetocero lorenzianum	11	563		10	22	73	27	18	9
chaetocero pseudocrinit	90		68	12	89	82	354	27	
chaetocero radicans	50	454	568	700	402	5902	3232	3096	2397
chaetocero septentriona		68			9		100	250	
chaetocero simile	25	145	54	44	12	163	218	64	109
chaetocero sociale	75	227	1044	160	246	173	2270		431
rhizosolen delicatula							36		27
rhizosolen fragilissima			14	2	4	23	18	23	27
rhizosolen hebetata f.semispina					6				5
rhizosolen stolterfothi		54	18		3	5	27	45	9
asterionel glacialis								27	
thalassion bacillaris	7	9		2	3				
thalassion nitzschoides	25	36	9	6		54	64	14	
nitzschia americana	222	1180	944	195	273	531	1825	1353	590
nitzschia delicatissim	538	1589	1062	324	920	1062	1507	1416	1535
nitzschia granii v.curvata					6				
nitzschia lineola			14	4					
nitzschia longissima	32	18	18	14	90	118	109	136	54
nitzschia pungens		14		2	3	9	14	9	14
nitzschia seriata					6	14	9		5
cylindroth fusiformis	3		9	10			9		
nephroselm spp. /bipedinomon			32						
tetraselmi spp. /pyramimonas						27		23	
prorocentr balticum		9		24	3		18		
dinophysis spp.						5			
gymnodiniu spp.	72				32			9	182
gymnodiniu gracilentum	95	9		36	34	64	154	18	9
peridiniac spp.		9	9	60	19	86	41		
gonyaulax spp.	7			2	3	9		5	

Continued	18–1	18–3	19–1	19–3	20–1	20–3	22–1	23–1	24–1
raphidophy sp.2				20					
cryptomona spp. 5–10		118			130	908		590	136
cryptomona spp. 11–20	22	41		4	9		127	82	
mesodinium rubrum				2					

CRUISE 83–02

Taxon	Station 25–1	26–1	27–1	28–1	29–9	30–10	31–1	32–1	33–9
ochromonas spp.	1498	8263	3500		5320	1680	1484	1344	616
dictyocha speculum					5				
apedinella spinifera						50			36
meringosph mediterranea				7000					
imantonia rotunda	2088	10930	4928	2225	4900	2604	9234	3248	3976
detonula pumila	14440	6538	7280	4720	5790	2385	6855	2380	612
leptocylin danicus	145	191	110	20	80	48	39	20	108
leptocylin minimus								6	
paralia sulcata						10			
stephanopy nipponica		9			10				3
skeletonem costatum	35300	26240	21130	19040	21900	5200	15050	3380	3408
thalassios spp.	9	9		5			4		
thalassios rotula		45	21	35		8	4		10
thalassios angulata			6			2			
thalassios anguste–line		14	24						
thalassios aestivalis	14			5				4	
thalassios nordenskiold	27	73	25	20		14	7	14	8
thalassios pacifica	208	572	290	180	265	46	96	40	74
thalassios eccentrica /symmetrica									4
thalassios mendiolana							8		6
thalassios conferta	327	45	71	185	155	20	3		3
biddulphi longicruris	9							4	
eucampia zoodiacus							2		
cerataulin pelagica	9	18							4
ditylum brightwellii						2			
chaetocero sp.gi			65		70	30			25
chaetocero sp.m				5	5				
chaetocero compressum	5502	2161	2096	1395	3420	65	900	506	186
chaetocero convolutum /concavicorr	32	54	20	55	35	4	26	12	20

Continued	25–1	26–1	27–1	28–1	29–9	30–10	31–1	32–1	33–9
chaetocero constrictum /vanheurckii	663	182	588	395	180	468	91	352	124
chaetocero debile	6320	2574	2794	1440	3975	846	2352	800	368
chaetocero diadema	345	18	303	130	50	20			19
chaetocero didymum	218	127	41	75	235	7	41	5	22
chaetocero laciniosum	36		39	20	55			6	12
chaetocero lorenzianum	27	18	26	25		12	18	10	22
chaetocero pseudocrinit	209	91					55	46	51
chaetocero radicans	1525	627	80	770	650	505	505	74	40
chaetocero septentriona	9		12	36	73			8	13
chaetocero simile	127	100	22	65	45	13	78	34	9
chaetocero sociale	145	45	150	110	55	148	64	4	12
rhizosolen delicatula	59		20				10	18	
rhizosolen fragilissima	9	27	5		10	2			
rhizosolen fragilissima v.1	23								
rhizosolen stolterfothi	54		19	5	5	2	4	4	3
asterionel glacialis			5			2			
thalassion bacillaris	9		5		5		3	4	4
thalassion nitzschoides		36	36		5		2	2	16
nitzschia americana	1062	885	885	270	590	312	428	402	286
nitzschia closterium				5					
nitzschia delicatissim	1353	1180	1250	595	875	390	560	234	418
nitzschia lineola							4		
nitzschia longissima	59	295	198	25	175	38	91	13	88
nitzschia pungens					5	4		6	3
nitzschia seriata		14						2	6
cylindroth fusiformis		9	4			4	4	4	3
nephroselm spp. /bipedinomon					25				
tetraselmi spp. /pyramimonas								28	22
halosphaer spp.		5							
eutreptiel spp.						4			2
prorocentr balticum						2	22	14	9

Continued	25–1	26–1	27–1	28–1	29–9	30–10	31–1	32–1	33–9
dinophysis spp.									2
gymnodiniu spp.	27		185	35	50	66	60	62	28
gymnodiniu gracilentum			40	20	80	82		35	
peridiniac spp.	23		11	10	15	12	20	38	20
gonyaulax spp.						10			3
ceratium fusus			2						
raphidophy sp.2									26
cryptomona spp. 5–10	45	227	35	60	50	17			60
cryptomona spp. 11–20					60				
mesodinium rubrum		5							

CRUISE 83–02

Station	P3	P4	P5	P6	P7	P8	P9	P10
Taxon								
ochromonas spp.	250	620	105	430	310	270	3024	350
corethron criophilum			1					
detonula pumila	1	88						
leptocylin minimus			12					
skeletonem costatum	110		166	18	12	50	60	46
thalassios spp.	1							
thalassios pacifica	2							
cerataulin pelagica					8			
chaetocero septentriona		2						
chaetocero simile	2		2					
rhizosolen delicatula	2							
rhizosolen stolterfothi			2					
asterionel bleakelyi		5						
thalassion bacillaris			3					
thalassion nitzschoides	1		2			5	3	
nitzschia americana		6						
nitzschia delicatissim	6	8	12	6	7	11	11	11
nitzschia longissima	2	4	3	5	5	8	7	6
gymnodiniu spp.			25	21	18	31		22
gymnodiniu gracilentum			52	41	31	40		19
gonyaulax spp.		3						
cryptomona spp. 5–10	8755	32830	19380	12770	48790	21940	49480	25760
cryptomona spp. 11–20	1893	2640	2280	865	1650	3310	4172	1780

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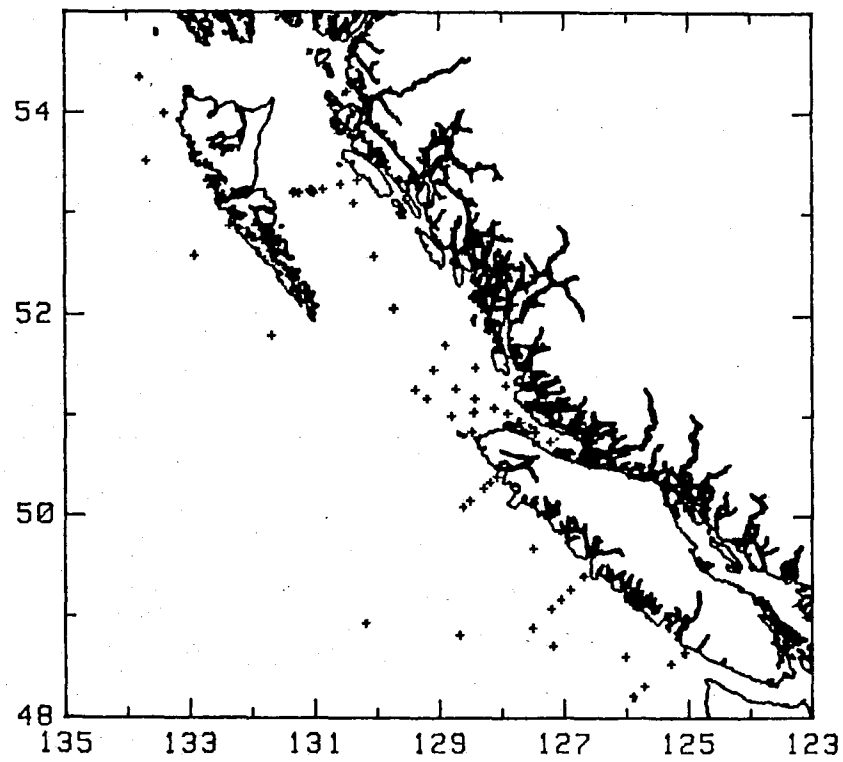
CRUISE 83–04

28 June – 10 July 1983

Area of operations: British Columbia continental shelf

Vessel: C.F.A.V. Endeavour



CRUISE 83–04

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
3–9	29 June 83	48 12.9	125 52.0	20.7	10.8	32.30	0.7	0.6	1.01	4.5
5–7		48 18.6	125 41.2	7.7	13.1	31.36	1.0	0.0	0.47	3.1
9–5		48 32.2	125 15.5	8.6	13.5	31.61	3.7	0.0	1.10	11.6
11–4		48 39.0	125 02.5	3.4	12.0	31.07	1.7	6.2	0.89	22.0
12–7	1 July 83	48 53.5	127 29.0	56.2	10.1	32.42	0.9	2.2	1.39	3.6
14–8		49 04.5	127 11.0	44.1	10.2	32.41	0.6	1.5	0.63	3.8
15–8		49 10.0	127 02.0	32.0	10.6	32.13	0.5	5.9	1.08	10.2
17–8		49 15.5	126 53.0	5.0	14.0	30.98	1.3	0.3	1.25	4.2
20–2		49 24.0	126 40.0	20.8	13.2	31.11	3.3	1.9	0.55	5.4
20–4		49 24.0	126 40.0	1.5	14.2	31.16	1.1	0.3	0.35	2.9
22–7	2 July 83	50 04.8	128 36.6	53.5	10.1	32.45	0.8	1.7	1.66	4.0
23–7		50 08.6	128 29.7	49.3	9.8	32.46	0.5	4.5	1.23	4.7
25–8		50 16.0	128 16.4	30.6	12.1	32.25	0.7	1.6	1.17	6.0
27–7		50 19.6	128 09.9	19.2	13.8	31.87	0.6	0.2	1.48	5.5
29–5		50 23.1	128 03.6	8.2	13.9	31.25	0.8	0.2	0.81	7.4
30–3		50 49.8	128 28.2	10.1	13.8	31.45	1.3	0.6	1.89	8.8
34–9		50 59.5	128 47.6	4.4	14.3	30.22	0.8			
38–8		51 10.0	129 11.0	19.2	12.8	31.43	0.9	2.1	0.75	8.2
40–9		51 15.6	129 22.3	20.0	11.7	31.80	0.7	3.8	0.69	11.1
43–3	3 July 83	51 27.4	129 04.4	20.9	12.6	30.88	0.9	0.0	0.67	6.7
47–9		51 16.0	128 43.2	11.9	12.7	30.96	0.9	0.1		7.1
50–2		51 09.9	128 24.9	17.1	10.4	31.31	1.4	10.9	1.49	17.7
50–4		51 09.9	128 24.9	4.6	12.3	31.01	3.1	0.5	1.13	4.0
53–7		51 04.1	128 06.4	7.9	12.5	31.12	2.4	0.3	1.52	3.1
55–8		51 01.6	128 26.0	17.6	10.8	31.36	3.1			
55–10		51 01.6	128 26.0	4.5	14.0	30.71	1.0			
58–7	4 July 83	51 01.1	127 53.4	10.0	12.6	31.44	2.4	1.2	1.68	6.7
60–10		50 56.0	127 41.0	9.8	10.6	31.37	1.2	10.1	1.94	18.2
P62–2		50 49.5	127 27.0	12.9	10.1	30.96	2.1	16.8	1.77	29.7
P62–4		50 49.5	127 27.0	3.1	10.5	30.81	0.6			
64–9		50 44.0	127 12.0	4.3	10.3	30.76	6.2	15.0	1.86	25.7
66–6		51 18.0	127 55.0	19.0	10.4	30.80	7.8	8.1	1.58	6.6
68–7	5 July 83	51 28.9	128 24.0	31.2	11.4	31.32	1.4	1.7	1.30	10.6
70–3		51 42.4	128 53.5	19.5	12.9	30.89	0.6			
73–8		52 03.4	129 42.8	10.1	13.8	31.14	0.2			

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
73–10	5 July 83	52 03.4	129 42.8	32.8	10.8	31.40	1.0			
75–8		52 34.2	130 01.9	28.5	11.8	31.15	0.9	1.0	0.73	9.3
77–8		53 05.5	130 21.1	20.4	11.1	31.06	1.6	5.7	1.80	14.7
79–6		53 19.2	130 18.1	20.0	13.5	30.91	0.9	0.0	0.50	7.8
82–6		53 16.7	130 34.0	28.7	10.4	31.32	0.8	6.6	1.69	13.6
86–3	6 July 83	53 12.0	131 02.7	20.7	12.1	31.54	5.6	0.6	1.43	4.7
94–1		53 11.6	131 00.3	30.1	11.8	31.45	6.5	2.4	1.59	7.1
94–3		53 11.6	131 00.3	9.1	12.6	31.49	3.1	0.0	1.42	3.1
96A–3		53 13.2	131 02.8	20.3	11.2	31.61	16.2	4.2	1.37	9.3
96M–2	7 July 83	53 13.2	131 02.8	29.4	11.6	31.60	14.4			
96Y–7		53 13.2	131 02.8	22.9	11.3	31.60	12.6	2.6	0.74	6.9
101–5		53 11.6	131 18.6	10.1	12.6	31.57	1.9	0.2	0.48	1.8
117–3	8 July 83	53 11.6	131 18.6	10.5	11.8	31.84				
125–5		53 11.6	131 18.6	10.0	12.6	31.56	1.0	0.3	0.43	2.2
129–4	9 July 83	53 11.5	131 13.6	20.9	10.7	31.69	6.5	6.6	1.06	14.8
129–6		53 11.5	131 13.6	10.5	12.7	31.56	1.1	0.3	0.34	2.2
134–7	10 July 83	54 04.0	130 43.0	10.9	13.1	30.89	0.6	0.6	0.53	5.7
U11/1500	11 July 83	54 21.0	133 47.0	0.0	14.1	31.85	0.3			
U11/2000		53 59.2	133 23.0	0.0	14.5		0.3			
U12/1100	12 July 83	53 30.7	133 41.0	0.0	14.1	32.08	0.2			
U13/1032	13 July 83	52 34.4	132 54.6	0.0	14.1	31.98	0.2			
U13/1535		52 52.0	132 20.8	0.0	14.0	31.74	0.7			
U14/1250	14 July 83	51 47.6	131 40.6	0.0	12.4	32.03	0.9			
U15/1145	15 July 83	49 40.5	127 29.0	0.0	14.9	31.73	0.7			
P2	29 June 83	48 36.0	126 00.0	0.0			0.5			
P5	30 June 83	48 42.6	127 10.0	0.0			0.1			
P8		48 49.0	128 40.0	0.0			0.2			
P11		48 56.0	130 10.0	0.0			0.1			

CRUISE 83–04

Taxon / Station	3–9	5–7	9–5	11–4	12–7	14–8	15–8	17–8
ochromonas spp.	4088	4994	7718	10420	499	410	460	816
dictyocha speculum				173		4	2	
apedinella spinifera				363				
imantonia rotunda	70450	23770	28980	13220	3632	20180	9975	10080
corymbellu aureus			2883					
leyanella arenaria			4703	6102			220	8026
corethron criophilum			9				3	
detonula pumila		77	109	82				
leptocylin danicus		118	272	790				
leptocylin minimus			2157					
leptocylin mediterraneu					109			
skeletonem costatum		73	254	3923				
thalassios spp.				177				
thalassios rotula				27				
thalassios angulata				14				
thalassios aestivalis				45				
thalassios pacifica		64	64	436				
thalassios conferta			354	227	14	48	2	27
biddulphi longicruris				18				
chaetocero sp.e			636	681				
chaetocero sp.gi			136					
chaetocero compressum		141		5993	218			
chaetocero convolutum /concavicorn		5		73				
chaetocero constrictum /vanheurckii		18		1998				
chaetocero danicum				82				
chaetocero debile		41	27	4994				
chaetocero diadema		9		304				
chaetocero didymum				182				

Continued	3–9	5–7	9–5	11–4	12–7	14–8	15–8	17–8
chaetocero laciniosum		9		86				
chaetocero lorenzianum				54				
chaetocero radicans		150	599	34190				
chaetocero septentriona				136				
chaetocero sociale		54		204				
bacteriast delicatula				9				
rhizosolen alata f.gracillima				14				
rhizosolen fragilissima	2							
rhizosolen fragilissima v.1		36	572	36				1
rhizosolen setigera				54				
rhizosolen stolterfothi				18				
pennales spp. 0–20			658					
asterionel glacialis			9					
thalassiot frauenfeldii				18				
thalassion bacillaris		9	14		32	2	3	
thalassion nitzschoides			18	136				*
nitzschia americana				68	14			109
nitzschia closterium	2				18	10	4	
nitzschia cylindroform					1308	240	31	44
nitzschia delicatissim			59	413		12	8	12
nitzschia granii v.curvata							2	
nitzschia lineola					45	2		
nitzschia longissima			9	77				1
nitzschia pungens				9				
nitzschia seriata				9				
nitzschia subcurvata	20				154	76	6	
cylindroth fusiformis		36		64				
nephroselm spp. /bipedinomon	60	91	863					18
tetraselmi spp. /pyramimonas			2415	862				652
pterosperm spp. /pachysphaer			23					
halosphaer spp.						12		1

Continued	3–9	5–7	9–5	11–4	12–7	14–8	15–8	17–8
eutreptiel spp.				14				1
prorocentr balticum			73	82				
dinophysis spp.				5				
gymnodiniu spp.	624	400	699	272	263	540	230	145
gymnodiniu gracilentum	194	136	881	568	772	109	565	26
katodinium rotundatum	66		350	1780			56	90
peridiniac spp.			250	23				
gonyaulax spp.				18				
ceratium furca				9				1
raphidophy sp.2							80	
cryptomona spp. 5–10	595	13600	32090	9579	45	250	1670	1232
cryptomona spp. 11–20	59	409	2860	3405	45	24	26	66
mesodinium rubrum			109					

CRUISE 83–04

Taxon \ Station	20–2	20–4	22–7	23–7	25–8	27–7	29–5	30–3	34–9
ochromonas spp.	5539	1035	468	322	6156	204	2044	790	1390
dictyocha speculum			1				2	2	
apedinella spinifera							24	50	
imantonia rotunda	8354	15510	9804	3215	25080	14730	10940	11970	4256
leyanella arenaria					140		308		168
detonula pumila	86	86						7	
leptocylin danicus	282	195						2	
leptocylin minimus	64	18							
stephanopy palmeriana							2		
skeletonem costatum	4994	195					12	280	9282
thalassios spp.			*					1	
thalassios rotula	5								4
thalassios aestivalis	9							2	
thalassios nordenskiold	27	73							2
thalassios pacifica	136				1		2	3	
thalassios mendiolana								2	
thalassios conferta	23	18			20		92	70	
eucampia zoodiacus	5							4	
cerataulin pelagica	18								
ditylum brightwellii								1	
chaetocero sp.gi		18					3	60	
chaetocero affine								56	10
chaetocero compressum	999	490						24	12
chaetocero constrictum /vanheurckii	73	23						2	
chaetocero debile	73	100							
chaetocero diadema	27							14	
chaetocero laciniosum								3	
chaetocero lorenzianum	18							10	4
chaetocero radicans	527	27						222	

Continued	20–2	20–4	22–7	23–7	25–8	27–7	29–5	30–3	34–9
chaetocero septentriona	32								
chaetocero simile	45								
chaetocero sociale	68	23						52	
chaetocero subtile	27							5	
rhizosolen alata f.alata		9							
rhizosolen alata f.gracillima	100								
rhizosolen delicatula								6	
rhizosolen fragilissima	9	14							
rhizosolen fragilissima v.1	18	27						32	
rhizosolen setigera	36								
rhizosolen stolterfothi	54								
asterionel glacialis	36							18	22
thalassion bacillaris								11	
thalassion nitzschoides								4	12
nitzschia americana	227	50	11					63	37
nitzschia bicapitata	68								
nitzschia closterium		36							
nitzschia cylindroform		14	136		75		127	34	
nitzschia delicatissim	91	23	3					84	65
nitzschia lineola	23							2	54
nitzschia longissima	118	14					6	8	
nitzschia pungens								12	18
nitzschia subcurvata			19		55	2			
nitzschia subpacifica								4	2
cylindroth fusiformis	5	50					1		5
nephroselm spp. /bipedinomon		73			20	88		16	
tetraselmi spp. /pyramimonas		145			50	46		170	22
pterosperm spp. /pachysphaer		36	12	2			22		
halosphaer spp.				14		12		8	
eutreptiel spp.						3			3
prorocentr balticum		18		1			11		4

Continued	20–2	20–4	22–7	23–7	25–8	27–7	29–5	30–3	34–9
gymnodiniu spp.	50	345	424	103	275	500	226	246	164
gymnodiniu gracilentum	227	390	492	224	122	156	108	160	94
katodinium rotundatum		23			30	25		90	20
peridiniac spp.		18		24				6	
heterocaps triquetra									2
ceratium furca		32							
raphidophy sp.2		14			125	38			
cryptomona spp. 5–10	400	1934	988	144	365	2330	6664	1250	284
cryptomona spp. 11–20	50	59	27	24	90	274	200	290	260

CRUISE 83–04

Taxon / Station	38–8	40–9	43–3	47–9	50–2	50–4	53–7	55–8	55–10
ochromonas spp.	4041	1624	3329	4879	2212	2316	1044	15960	2352
dictyocha speculum	36	7	2	2	4	9	9	4	
apedinella spinifera						14			
imantonia rotunda	35450	9758	15280	16300	34090	69870	22250	40360	32950
leyanella arenaria	11950	67	6156	1484	12200	8517	1998	36820	1876
detonula pumila				1			9		
leptocylin danicus							14		
leptocylin mediterraneu				5					
skeletonem costatum	645	8			662	16490	2860	26	12
thalassios spp.		4	2		2		14		
thalassios rotula							9		
thalassios angulata					3				
thalassios tenera					7				
thalassios nordenskiold						14	23		
thalassios pacifica				3	2		9	2	
thalassios conferta				16	134	27	68	460	4
coscinodis spp.					2				
cerataulin pelagica						36	18		
chaetocero sp.gi	36	4			18	68		55	18
chaetocero affine							27		
chaetocero compressum						109	381		
chaetocero debile						50	54		
chaetocero diadema							36		
chaetocero lorenzianum					3	18	9		
chaetocero radicans						127	572		
chaetocero septentriona						68			
chaetocero simile						5			
chaetocero sociale						590	3314		

Continued	38–8	40–9	43–3	47–9	50–2	50–4	53–7	55–8	55–10
bacteriast delicatula						9	127		
rhizosolen alata f.gracillima							14		
rhizosolen delicatula						14	145		
rhizosolen fragilissima	9				1		73		
rhizosolen fragilissima v.1						9	6		
rhizosolen stolterfothi						9	18		
asterionel glacialis						18		6	
thalassion bacillaris	9	6	4	4	36	54	18	11	
thalassion nitzschoides		2	1		68	173	73	16	
nitzschia americana	18	4		2	11	54	218	5	4
nitzschia bicapitata				269		82	114	25	
nitzschia closterium				4			154		
nitzschia cylindroform	745	74	96	2160	286	2838	136	1440	590
nitzschia delicatissim	27	5	1		26	145	254	15	3
nitzschia granii v.curvata	5			1					
nitzschia lineola	14	4		4	57	409	136	7	
nitzschia longissima	9				4	14	36		2
nitzschia pungens						32	54		
nitzschia seriata	9								
nitzschia subpacifica						100	114		
cylindroth fusiformis	5	2			2			2	
nephroselm spp. /bipedinomon		14		291			114	130	1020
tetraselmi spp. /pyramimonas	23	50	500	1053		163	795	120	920
pterosperm spp. /pachysphaer		16	80	104				70	60
halosphaer spp.		10					41		
prorocentr balticum		11	58	46		11	5	24	6
gymnodiniu spp.	127	528	1187	144	208	581	636	400	460
gymnodiniu gracilentum	27	184	192	240	168	136	159	390	330
katodinium rotundatum	82	80	1277	154	72	227	749	800	54
peridiniac spp.									8
heterocaps triquetra							9		

Continued	38–8	40–9	43–3	47–9	50–2	50–4	53–7	55–8	55–10
gonyaulax spp.							9		
ceratium furca	5		1						
raphidophy sp.2				36					
cryptomona spp. 5–10	3768	2318	5757	4241	3032	5902	4358	12430	3668
cryptomona spp. 11–20	1353	460	728	236	188	1335	817	1090	725
mesodinium rubrum							9		

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Station	58–7	60–10	P62–2	P62–4	64–9	66–6	68–7	70–3
Taxon								
ochromonas spp.	560	850	683	1544	863	454	4032	772
dictyocha speculum	14	10		9				
imantonia rotunda	1288	9633	11910	18430	11950	5811	19610	15250
leyanella arenaria	9758	2604	1653	12840	3686	2415	2436	3051
detonula pumila	6	3	7		18	18		
leptocylin danicus	3				45	27		
leptocylin mediterraneu								18
skeletonem costatum	1040	896	130	7300	18410	64290		
thalassios spp.	1				14	27		
thalassios rotula	9				18	45		
thalassios angulata		1	1			14		
thalassios tenera		2	2					
thalassios aestivalis	5	2	2	9	50			
thalassios nordenskiold	12					23		
thalassios pacifica	26	2	8		45	82		
thalassios conferta	132	176	6	9	14	23	21	14
coscinodis spp.			1			5		
cerataulin pelagica	2		2					
ditylum brightwellii	1							
chaetocero sp.gi	36		8					
chaetocero affine			1		23	118		
chaetocero compressum	80	12		18	463	354		
chaetocero convolutum /concavicorı	5		9		32	23		
chaetocero constrictum /vanheurckii					109			
chaetocero curvisetum		4		91	27	118		
chaetocero debile	21				173	490		
chaetocero diadema				27	64	73		
chaetocero laciniosum	5				127	18		

Continued	58–7	60–10	P62–2	P62–4	64–9	66–6	68–7	70–3
chaetocero lorenzianum	10		2		36	18		
chaetocero radicans	684	20	8	45	1362	409		
chaetocero simile						18		
chaetocero sociale	1028	460		182	2088	772		
bacteriast delicatula	41							5
rhizosolen alata f.gracillima	6							18
rhizosolen delicatula	21	14	15	14	64	9		
rhizosolen fragilissima	2	3	6	9	27	41		
rhizosolen fragilissima v.1	14	1						9
rhizosolen stolterfothi	1					9		
asterionel glacialis	108	2	1	54	163	91		
thalassion bacillaris	27	37	3		18	9		
thalassion nitzschoides	40	19	31	27	291	191		
nitzschia americana	200	31	8		82	54		
nitzschia bicapitata	40					32		
nitzschia cylindroform	138				18		300	250
nitzschia delicatissim	448	24	44	109	209	236	4	
nitzschia lineola	34	24	34	209	509	1535		
nitzschia longissima	38		12		23			
nitzschia pungens	24		14	9	54	59		
nitzschia seriata	4	1	11	18	9			
nitzschia subpacifica	48	11	*		23	150		
cylindroth fusiformis	5	2						
nephroselm spp. /bipedinomon				136				82
tetraselmi spp. /pyramimonas	158	60	28	204	182	82		182
halosphaer spp.		45						
prorocentr balticum	11							
gymnodiniu spp.	144	100	90	150	95	100	262	427
gymnodiniu gracilentum	134		100	91	104	86	675	272
katodinium rotundatum	104	130	16	114	91	73	35	218
peridiniac spp.	5							

Continued	58–7	60–10	P62–2	P62–4	64–9	66–6	68–7	70–3
gonyaulax spp.	1							
ceratium spp.	1							
raphidophy sp.2		26						
cryptomona spp. 5–10	2371	940	2759	2361	527	282	3528	3541
cryptomona spp. 11–20	608	394	119	268	127	59	134	490
mesodinium rubrum	25							

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Taxon / Station	73–8	73–10	75–8	77–8	79–6	82–6	86–3	94–1	94–3
ochromonas spp.	728	184	1030	1480	2850	560	1271	500	499
dictyocha speculum		1			26				5
imantonia rotunda	6019	3374	11400	17670	17840	9975	4903	829	2542
leyanella arenaria	157	997	196	8037	4396	3864			127
detonula pumila							36	25	50
leptocylin danicus							127	37	45
leptocylin mediterraneu						14			14
stephanopy palmeriana							36	4	73
thalassios spp.									14
thalassios rotula							9		
thalassios pacifica							18	1	
thalassios conferta	8	2	130	17	2	42	232	78	27
thalassios leptopus								1	
coscinodis spp.								*	
biddulphi longicruris								18	18
eucampia zoodiacus							23		5
cerataulin pelagica							5	4	5
ditylum brightwellii							14	2	
chaetocero sp.e									2247
chaetocero sp.gi							68		
chaetocero affine							9		
chaetocero compressum					10				
chaetocero convolutum /concavicom					2		18	7	23
chaetocero constrictum /vanheurckii							236	758	350
chaetocero debile							32	172	159
chaetocero diadema								26	91
chaetocero lorenzianum					6		27	53	14
chaetocero septentriona							1453	488	1044

Continued	73–8	73–10	75–8	77–8	79–6	82–6	86–3	94–1	94–3
chaetocero sociale							68	131	291
bacteriast delicatula					156			1	18
rhizosolen alata f.gracillima							436	408	104
rhizosolen fragilissima								*	
rhizosolen stolterfothi					1		263	312	472
asterionel glacialis					*				
thalassiot frauenfeldii							18		18
thalassiot longissima								12	
thalassion bacillaris					26	1	45	14	41
thalassion nitzschoides					8	1	54	21	
naviculace spp.								18	
tropidonei lepidoptera								14	
nitzschia americana								106	118
nitzschia closterium		*							
nitzschia cylindroform	42	76	135	360	54	365	363	158	136
nitzschia delicatissim						5	118	14	27
nitzschia granii v.curvata		1							
nitzschia lineola					1				23
nitzschia longissima						2	9	5	5
nitzschia pungens					2	6	1662	426	50
cylindroth fusiformis					1			1	
nephroselm spp. /bipedinomon			25	100	152	230			
tetraselmi spp. /pyramimonas	52	20	80	192	200			300	32
pterosperm spp. /pachysphaer	8		30						
halosphaer spp.	20								
prorocentr balticum					20	1			23
dinophysis spp.					1				
gymnodiniu spp.	278	224	530	500	104	195	545	66	86
gymnodiniu gracilentum	126	104	685	88	156	485	204	26	409
katodinium rotundatum	48	106	180	188	184				
peridiniac spp.						3			27

Continued	73–8	73–10	75–8	77–8	79–6	82–6	86–3	94–1	94–3
gonyaulax spp.					2				
ceratium furca					4		9		
ceratium longipes					*				
raphidophy sp.2		8	12			14			
cryptomona spp. 5–10	806	974	2130	5348	3739	1410	64	212	477
cryptomona spp. 11–20	160	408	210	130	182	230	114	112	45
mesodinium rubrum					2				36

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Taxon / Station	96A–3	96M–2	96Y–7	101–5	117–3	125–5	129–4	129–6	134–7
ochromonas spp.	1226	590	1456	403	806	280	440	450	752
dictyocha speculum	9			1	1				6
apedinella spinifera			9					11	
imantonia rotunda	6174	3920	3724	2576	4264	2632	5068	3220	1702
corymbellu aureus			80	13	9	76			
leyanella arenaria				134					134
detonula pumila	109	61	48	22	6	16	62	28	
leptocylin danicus	490	208	340	49	35	70	195	76	2
leptocylin mediterraneu			2	10	5	18			9
stephanopy palmeriana	9	9	148	6			27	5	
thalassios spp.	14			1		2	9		
thalassios anguste–line				5				6	2
thalassios tenera		4							2
thalassios nordenskiold						1			
thalassios pacifica		9	5	5					1
thalassios conferta	182	72	70	12	27	32	30	99	7
thalassios leptopus				1					
coscinodis spp.			2		*				
biddulphi longicruris	86	27	81		2	7		12	
eucampia zoodiacus	18	136	102		8		14	25	
hemiaulus membranaceus				9					
cerataulin pelagica	14	10	11	6	2		3		
ditylum brightwellii		8		3	10	5		6	
chaetocero sp.e			35		124	250	110	15	
chaetocero sp.gi	36	12						7	
chaetocero sp.m			13						1
chaetocero affine							4		
chaetocero boreale			6		1				1

Continued	96A–3	96M–2	96Y–7	101–5	117–3	125–5	129–4	129–6	134–7
chaetocero convolutum /concavicorı	45		21		1	2		273	
chaetocero constrictum /vanheurckii	2919	1026	1650		37	64	81	39	
chaetocero debile	218	127	871		8	6	62	39	
chaetocero diadema	236	172	312		6	2	45	156	
chaetocero laciniosum						10			
chaetocero lorenzianum	36	60	95	4	1				
chaetocero septentriona	9398	180	1055	44	5	165	1932	132	16
chaetocero sociale	109	54	112				95		210
bacteriast delicatula			14	*	1	4			
rhizosolen alata f.alata		3							
rhizosolen alata f.gracillima	1886	81	91		43	68	227	78	2
rhizosolen delicatula				4				8	
rhizosolen fragilissima v.1				2					
rhizosolen setigera									9
rhizosolen stolterfothi	885	735	1235	156	60	67	505	123	
thalassiot longissima	45	58	24	11	1	10	4		
thalassion bacillaris		40	11	6	6	18	5		2
thalassion nitzschoides	45	13	5	10			10	4	
naviculace spp.	45	27				3	11	8	1
pleurosigm acutum								2	
nitzschia americana	1008	50	690			2	37	56	5
nitzschia cylindroform			90	108	4		12		4
nitzschia delicatissim	309	108					11	38	
nitzschia lineola			57						3
nitzschia longissima	95	61	48		2	9	9		1
nitzschia pungens	10620	6197	4336	948	768	715	3360	1660	4
nitzschia seriata				4				7	
nitzschia subpacifica			35			11			3
cylindroth fusiformis		5			*				
nephroselm spp. /bipedinomon				48	96			50	12
tetraselmi spp. /pyramimonas				28					23

Continued	96A–3	96M–2	96Y–7	101–5	117–3	125–5	129–4	129–6	134–7
pterosperm spp. /pachysphaer					5	2		60	14
halosphaer spp.									1
prorocentr balticum				14	1	12	7	24	2
dinophysis spp.					*				1
gymnodiniu spp.	32	27	75	97	129	66	22	53	48
gymnodiniu gracilentum	45	42	80	408	376	605	380	590	206
peridiniac spp.			40	20	19	8		10	6
heterocaps triquetra									1
gonyaulax spp.			6	2	9				
ceratium furca			3	1				4	2
raphidophy sp.2						2			3
cryptomona spp. 5–10	522	250	68	636	50	170	250	130	572
cryptomona spp. 11–20	50	115	19	19	20	62	11	30	81
mesodinium rubrum			10	5	1		5	6	

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Taxon / Station	U11/1500	U11/2000	U12/1100	U13/1032	U13/1535	U14/1250	U15/1145
ochromonas spp.	910	692	410	1590	7011	1000	3724
apedinella spinifera				9	10		
imantonia rotunda	7638	4104	6270	14590		12650	15390
leyanella arenaria	4088						
leptocylin danicus							74
leptocylin minimus							54
skeletonem costatum							125
thalassios pseudonana	1250						510
thalassios conferta						50	58
cerataulin pelagica							3
chaetocero sp.e					75	65	
chaetocero sp.gi						5	
chaetocero compressum							13
chaetocero convolutum /concavicorn				3			
chaetocero didymum							7
chaetocero lorenzianum							10
chaetocero perpusillum							21
chaetocero subtile							7
rhizosolen fragilissima							3
rhizosolen fragilissima v.1							23
rhizosolen stolterfothi							3
thalassion bacillaris	2						4
nitzschia americana							16
nitzschia closterium	11	184	16	118	202	108	13
nitzschia cylindroform	458	309	17	10	22	98	82
nitzschia delicatissim			7	12	15	16	13
nitzschia lineola				4			4

Continued	U11/1500	U11/2000	U12/1100	U13/1032	U13/1535	U14/1250	U15/1145
nitzschia longissima							12
nitzschia pungens						18	
nitzschia subcurvata	14	6	54	164	10	38	12
nephroselm spp. /bipedinomon				13	100		410
tetraselmi spp. /pyramimonas	14	10		8	272		2380
cymbomonas spp.							3
pterosperm spp. /pachysphaer		12	8	15			7
halosphaer spp.		3	36	8			6
prorocentr balticum	3					5	
gymnodiniu spp.	60	44	52	65	27	178	122
gymnodiniu gracilentum	11		640	630	405	510	450
katodinium rotundatum						63	34
peridiniac spp.		9		20	9	9	24
ceratium furca	2			3			
raphidophy sp.2			28	24	13850	16	
cryptomona spp. 5–10	31	976	140	230	3920	3052	2828
cryptomona spp. 11–20	160	10	10	10	458	163	112

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Station / Taxon	P2	P5	P8	P11
ochromonas spp.	3500		310	200
imantonia rotunda	20290		6132	1691
leyanella arenaria	140			
corethron criophilum			3	
leptocylin danicus	72			
thalassios nordenskiold	2			
thalassios pacifica	4			
chaetocero sp.m	1			
chaetocero compressum	8			
chaetocero convolutum /concavicorn		2		
chaetocero lorenzianum	9			
bacteriast delicatula	2			
rhizosolen delicatula	4			
rhizosolen fragilissima	2			
rhizosolen fragilissima v.1	82			
rhizosolen setigera	2			
rhizosolen stolterfothi	7			
asterionel glacialis	2			
thalassion bacillaris	3			
nitzschia americana	18			
nitzschia closterium			60	
nitzschia granii v.curvata	1			
nitzschia longissima	8			
nitzschia subcurvata			61	
nitzschia subpacifica	3			
cylindroth fusiformis	12			
nephroselm spp. /bipedinomon	230			12
tetraselmi spp. /pyramimonas	202			8

Continued	P2	P5	P8	P11
pterosperm spp. /pachysphaer	115			
halosphaer spp.	4		10	
prorocentr balticum			4	
prorocentr gracile	5			
gymnodiniu spp.	200	64	28	35
gymnodiniu gracilentum	670	36	264	78
peridiniac spp.	98		6	
ceratium furca	1			
cryptomona spp. 5–10	1040		640	278
cryptomona spp. 11–20	12		45	24

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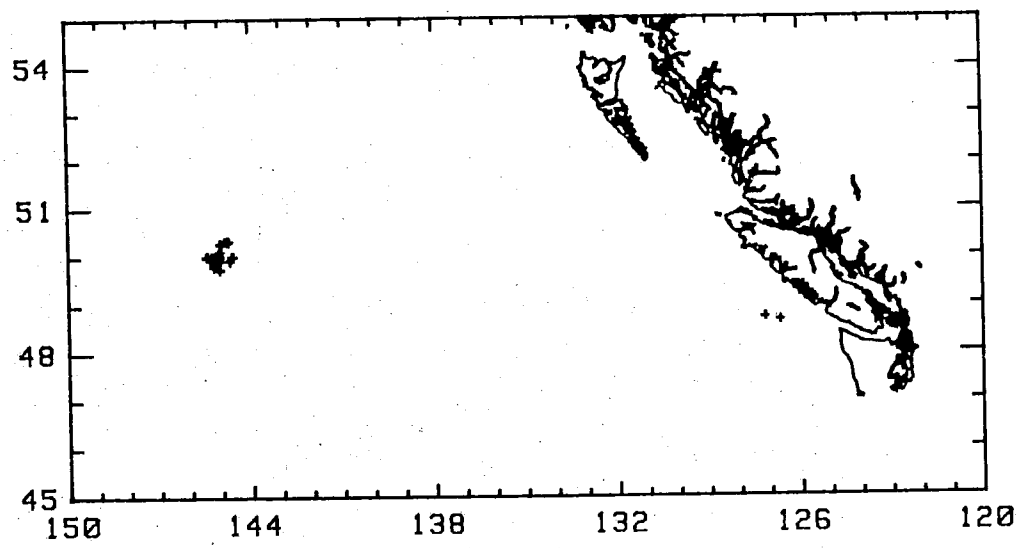
CRUISE 84–02

7 – 25 May 1984

Area of operations: Subarctic Pacific Ocean (SUPER Project)

Vessel: C.S.S. Parizeau



CRUISE 84–02

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
1–4N	12 May 84	49 47.1	143 16.9	41.2	6.6	32.58	0.3	11.7	1.33	17.9
1–9N		49 47.1	143 16.9	7.2	6.9	32.58	0.3	12.2	1.29	19.2
3–6A		50 00.0	145 00.0	41.4	6.7	32.57	0.3	11.7	1.27	17.5
3–9A		50 00.0	145 00.0	9.0	7.1	32.57	0.2	11.6	1.27	17.5
3–9N		50 00.0	145 00.0	9.0	7.1	32.57	0.2	11.6	1.27	17.5
5–4N		49 54.6	145 00.0	41.5	6.8	32.57	0.4			
5–8N		49 54.6	145 00.0	8.0	7.1	32.57	0.4			
6–6A	13 May 84	49 43.8	145 00.0	40.1	6.4	32.59	0.4	12.8	1.35	22.2
6–9A		49 43.8	145 00.0	9.5	7.0	32.57	0.5	10.8	1.22	16.7
6–9N		49 43.8	145 00.0	9.5	7.0	32.57	0.5	10.8	1.22	16.7
8–7A		50 00.0	145 25.2	39.6	6.3	32.57	0.5	13.0	1.37	20.3
8–7N		50 00.0	145 25.2	39.6	6.3	32.57	0.5	13.0	1.37	20.3
8–9A		50 00.0	145 25.2	9.1	6.8	32.58	0.5	12.1	1.31	19.0
11–6A		50 00.0	145 00.0	40.9	6.9	32.57	0.4	11.5	1.25	17.4
11–6N		50 00.0	145 00.0	40.9	6.9	32.57	0.4	11.5	1.25	17.4
11–9A		50 00.0	145 00.0	8.1	7.0	32.56	0.4	11.6	1.20	17.4
14–6A		50 00.0	144 34.8	41.1	6.8	32.56	0.7	11.7	1.27	17.9
14–9A		50 00.0	144 34.8	9.6	7.1	32.56	0.4	9.9	1.28	15.3
21–7aA	21 May 84	49 55.0	144 40.0	35.6	7.2	32.54	0.3	10.9	1.17	17.5
21–7bA		49 55.0	144 40.0	35.6	7.2	32.54	0.3	10.9	1.17	17.5
21–7cA		49 55.0	144 40.0	35.6	7.2	32.54	0.3	10.9	1.17	17.5
21–7dA		49 55.0	144 40.0	35.6	7.2	32.54	0.3	10.9	1.17	17.5
21–9aA		49 55.0	144 40.0	11.9	7.2	32.55	0.3	9.8	1.25	15.3
21–9bA		49 55.0	144 40.0	11.9	7.2	32.55	0.3	9.8	1.25	15.3
21–9cA		49 55.0	144 40.0	11.9	7.2	32.55	0.3	9.8	1.25	15.3
21–9dA		49 55.0	144 40.0	11.9	7.2	32.55	0.3	9.8	1.25	15.3
A2–5A	14 May 84	49 47.6	145 11.6	42.3	6.7	32.57	0.6	11.8	1.30	17.9
A2–5N		49 47.6	145 11.6	42.3	6.7	32.57	0.6	11.8	1.30	17.9
A2–8A		49 47.6	145 11.6	11.4	7.1	32.57	0.5	11.7	1.26	18.4
E–5A		49 50.6	145 10.3	39.1	6.8	32.56	0.6	12.0	1.33	19.0
E–8A		49 50.6	145 10.3	8.0	6.9	32.57	0.6			
F2–6A	16 May 84	49 59.5	145 14.6	41.9	6.5	32.59	0.5	12.6	1.33	19.4
F2–9A		49 59.5	145 14.6	9.9	6.9	32.54	0.7	11.8	1.26	19.6
K–2A	19 May 84	50 16.1	144 57.6	36.0			0.8			

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
K–2N	19 May 84	50 16.1	144 57.6	36.0			0.8			
K–5A		50 16.1	144 57.6	7.0			0.8			
OA		50 19.1	144 48.6							
R–2A	20 May 84	50 18.8	144 43.4	36.0			1.0			
R–4A		50 18.8	144 43.4	7.0			1.1			
P4N	24 May 84	48 39.0	126 40.0	0.0						
P5aA		48 42.6	127 10.0	0.0						
P5bA		48 42.6	127 10.0	0.0						

CRUISE 84–02

Taxon / Station	1–4N	1–9N	3–6A	3–9A	3–9N	5–4N	5–8N
ochromonas spp.	910	785	1110	760	780	1904	1090
pedinellac sp.239	2						
emiliania huxleyi	98	60	64	38	57	82	105
imantonia rotunda	9804	9918	12830	8848	7140	21550	11970
corymbellu aureus			12	25			
chrysochro sp.1			32	17		27	
chrysochro spp. 3–6	2086	1624	1988	1764	1512	3668	2002
chrysochro spp. 6–10	550	455	1060	770	127	250	110
phaeocysti pouchetii			31	37			165
leyanella arenaria			114			392	
thalassios spp.	3	7		4	2		
thalassios conferta	2	1					4
rhizosolen alata f.gracillima							3
nitzschia closterium v.striatula	18	1	11	39	48	28	10
nitzschia cylindrus / cylindroformis	60	39	400	172	202	180	530
nitzschia lineola		2	4				13
denticulop semina	3			6	1		
micromonas pusilla?		6144				9216	
nephroselm spp. /bipedinomon			46	31			
prorocentr balticum	10	3	9	12	11	26	10
gymnodiniu spp.	12	4	10	13	15	11	4
gymnodiniu gracilentum	33	14	27	14	21	37	42
raphidophy sp.2	830	266	380	178	645	685	157
cryptomona spp. 5–10			2	3		11	4
cryptomona spp. 11–20			9	4	3	2	1

CRUISE 84–02

Station	6–6A	6–9A	6–9N	8–7A	8–7N	8–9A	11–6A	11–6N	11–9A
Taxon									
ochromonas spp.	1500	1900	2156	2296	1988	3780	1820	1582	2436
pedinellac sp.239		7	1			5			
meringosph mediterranea	1								
emiliania huxleyi	209	93	127	186	267	54	61	46	140
imantonia rotunda	14590	20860	16760	20980	21430	32030	19720	15790	23140
corymbellu aureus	68	99		10		90	21		17
chrysochro sp.1	580	32		144	148	230	65		137
chrysochro spp. 3–6	1764	12152	4116	2772	2632	3696	3192	2996	3780
chrysochro spp. 6–10	142	1910	1510	380	420	198	200	220	296
phaeocysti pouchetii	282	77		60		47	38		51
corethron criophilum	2								1
thalassios spp.	3	4		4	3	7			
thalassios conferta			6						
chaetocero filiforme					5				
chaetocero peruvianum							2	3	
nitzschia closterium v.striatula	109	209	180	81	64	194	40	48	54
nitzschia cylindrus /cylindroformis	3780	232	222	3276	3514	3528	1022	1274	1330
nitzschia lineola	3	7	3						
nitzschia longissima						2			
denticulop semina	3	40	27						
nephroselm spp. /bipedinomon	22	13		38		17	30		25
tetraselmi spp. /pyramimonas		10							
pterosperm spp. /pachysphaer	2								
prorocentr balticum	15	27	30	9	4	6	4	3	21
gymnodiniu spp.	43	19	18	39	45	33	3	5	8
gymnodiniu gracilentum	34	50	56	41	49	43	8	12	19
raphidophy sp.2	685	244	410	480	575	1020	444	68	302
cryptomona spp. 5–10	10	11	24	10	7	23	11	11	7

Continued	6–6A	6–9A	6–9N	8–7A	8–7N	8–9A	11–6A	11–6N	11–9A
cryptomona spp. 11–20	15	9	4	11	12	14	9	7	4

CRUISE 84–02

Station	14–6A	14–9A
Taxon		
ochromonas spp.	2492	2380
pedinellac sp.239	7	10
meringosph mediterranea	2	4
emiliania huxleyi	384	925
imantonia rotunda	22000	17100
corymbellu aureus	11	
chrysochro sp.1	338	278
chrysochro spp. 3–6	5348	1020
chrysochro spp. 6–10	388	160
phaeocysti pouchetii	44	64
thalassios spp.		11
thalassios conferta	16	8
coscinodis spp.	2	
chaetocero peruvianum	5	12
nitzschia closterium v.striatula	308	462
nitzschia cylindrus /cylindroformis	910	12330
nitzschia lineola	19	
nitzschia longissima	3	
denticulop semina		4
nephroselm spp. /bipedinomon	23	9
halosphaer spp.	1	4
prorocentr balticum	9	16
gymnodiniu spp.	48	34
gymnodiniu gracilentum	47	185
raphidophy sp.2	685	230
cryptomona spp. 5–10	20	50
cryptomona spp. 11–20	11	41

CRUISE 84–02

Taxon / Station	21–7aA	21–7bA	21–7cA	21–7dA	21–9aA	21–9bA	21–9cA	21–9dA
ochromonas spp.	915	880	495	440	735	675	1015	870
pedinellac sp.239	1		2		8	14		
meringosph mediterranea			2					
emiliania huxleyi	202	181	18	217	111	90	190	236
imantonia rotunda	7196	6580	5348	5992	7000	6692	6804	6860
chrysochro sp.1	40	24	16	18	50	42	21	16
chrysochro spp. 3–6	625	740	990	900	1710	248	820	770
chrysochro spp. 6–10	41	57	162	116	88	80	80	86
thalassios spp.		4			4	6	5	3
thalassios conferta	4	5	10	8	3			
coscinodis spp.	4		2	5				5
chaetocero filiforme			3					
chaetocero peruvianum	4	3	6	4	4	3		
nitzschia closterium v.striatula	80	70	51	60	60	81	66	72
nitzschia cylindrus /cylindroformis	1512	1806	2240	2184	2898	2492	2100	1988
nitzschia granii v.curvata							2	1
nitzschia lineola		3	5	2	6	4	16	27
nitzschia longissima			2		2	1		
nitzschia pungens	2							
denticulop semina	2		5	7	1			
nephroselm spp. /bipedinomon	36	41		11	32	21	18	10
halosphaer spp.			3				1	3
prorocentr balticum	50	72	35	63	27	18	19	24
gymnodiniu spp.	22	16	57	43	23	17	21	20
gymnodiniu gracilentum	28	54	27	43	12	17	26	21
raphidophy sp.2	114	135	100	127	62	65	148	129
cryptomona spp. 5–10	2	8	14	11	6	7		
cryptomona spp. 11–20	9	7	38	44	2	3	6	8

CRUISE 84–02

Station	A2–5A	A2–5N	A2–8A	E5A	E8A	F2–6A	F2–9A
Taxon							
ochromonas spp.	2730	2660	2688	1750	3080	1456	3500
pedinellac sp.239					3		8
meringosph mediterranea	6						
emiliania huxleyi	205	306	725	290	295	193	288
imantonia rotunda	26450	23940	24510	17900	26560	15110	33520
corymbellu aureus	51	35			28	15	
chrysochro sp.1	224	176	50	336	77	226	112
chrysochro spp. 3–6	5824	5012	3360	2996	4424	4592	4956
chrysochro spp. 6–10	394	635	190	340	2050	232	1120
phaeocysti pouchetii	16	–	25	71	51	36	94
thalassios spp.	2				10		4
thalassios conferta							4
chaetocero peruvianum	61	43	30	12	10		13
nitzschia closterium v.striatula	313	240	154	212	182	249	216
nitzschia cylindrus /cylindroformis	2618	2100	1554	2730	4004	2030	3752
nitzschia lineola	23	18	2	14	12		
nitzschia pungens							3
denticulop semina						3	
nephroselm spp. /bipedinomon	50	41		18	63		24
pterosperm spp. /pachysphaer				8		2	7
halosphaer spp.							2
prorocentr balticum	32	33	41	3	12		36
prorocentr gracile						8	
gymnodiniu spp.	168	88	17	19	8	55	48
gymnodiniu gracilentum	52	60	28	9	8	34	12
raphidophy sp.2	755	555	516	570	680	1190	452
cryptomona spp. 5–10	8	5	11	6		10	
cryptomona spp. 11–20			6	12	7	6	8

CRUISE 84–02

Taxon / Station	K–2A	K–2N	K–5A	OA	R–2A	R–4A	P4N	P5aA	P5bA
ochromonas spp.	2576	2436	2604	3556	4592	4536	2016	2044	1750
dinobryon suecicum							78		
dictyocha speculum				1					
pedinellac sp.223				85					
pedinellac sp.239	18	15	12		10	4			
apedinella spinifera				73					
meringosph mediterranea	2								
emiliania huxleyi	276	380	163		295	42			
imantonia rotunda	23030	19380	23600	30895	37620	46970	16530	17210	17780
chrysochro sp.1	568	410	458		342	2			
chrysochro spp. 3–6	5600	8778	8596	4648	5376	7308	3976	3304	3108
chrysochro spp. 6–10	502	900	1780	800	306	440	230	165	210
phaeocysti pouchetii				68					
leyanella arenaria				2184					
thalassios spp.	19	5	12	2	5	4		6	2
thalassios conferta					12	5			3
cerataulin pelagica							20	8	3
chaetocero compressum									6
chaetocero convolutum /concavicorn							2		2
chaetocero decipiens				6			3		6
chaetocero peruvianum	7	2	8		7	17	2	29	6
rhizosolen alata f.alata							1390		
rhizosolen alata f.gracillima				24				104	24
rhizosolen fragilissima				4			8	7	2
rhizosolen stolterfothi							49	28	36
rhizosolen styliformis v.styliformi								18	
thalassion bacillaris				3					
thalassion nitzschoides				8					

Continued	K–2A	K–2N	K–5A	OA	R–2A	R–4A	P4N	P5aA	P5bA
licmophora abbreviata							12	20	26
nitzschia americana				103					
nitzschia closterium v.striatula	354	230	214		108	125	22	48	54
nitzschia cylindrus /cylindroformis	5572	1820	6356	260	7532	7616	152	342	280
nitzschia delicatissim				7					
nitzschia granii v.curvata	2			4	4	2			
nitzschia lineola	3		13						
nitzschia longissima							1		
cylindroth fusiformis				2					
denticulop semina	5	1			4				
micromonas pusilla?				20480					
nephroselm spp. /bipedinomon	69		185	74	190	270			
tetraselmi spp. /pyramimonas				915			69		
pterosperm spp. /pachysphaer			5	54		9			3
halosphaer spp.							19		2
eutreptiel spp.				5					
prorocentr balticum	12	16	10	1	8	17	3		
gymnodiniu spp.	70	60	130	302	127	148	65	21	31
gymnodiniu gracilentum	66	58	95	65	97	27	5		
katodinium rotundatum				1360			5		
peridiniac spp.							22		
raphidophy sp.2	570	455	115		456	545	15	22	18
cryptomona spp. 5–10	3	4	11	2380	20	17	97	348	300
cryptomona spp. 11–20	5	5	19	1600	13	7	127	8	12
hemiselmis spp. 4–6				2352					

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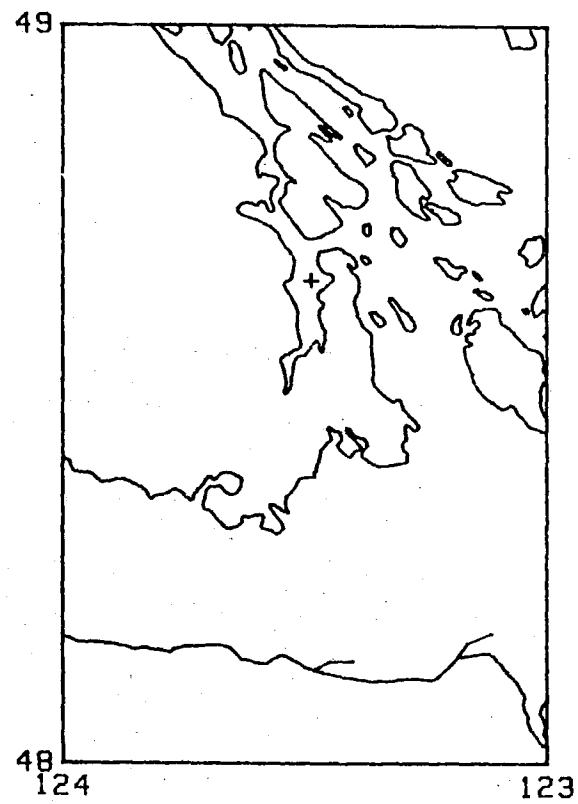
CRUISE 84–SI

5 July 1984

Area of operations: Saanich Inlet

Vessel: Launch



CRUISE 84–SI

Station	Date	Latitude	Longitude	Depth	Temperature	Salinity	Chlorophyll	Nitrate	Phosphate	Silicate
SI1X	5 July 84	48 39.3	123 29.3	3.0						
SI1Y		48 39.3	123 29.3	3.0						
SI2X		48 39.3	123 29.3	3.0						
SI2Y		48 39.3	123 29.3	3.0						
SI3X		48 39.3	123 29.3	3.0						
SI3Y		48 39.3	123 29.3	3.0						
SI4X		48 39.3	123 29.3	3.0						
SI4Y		48 39.3	123 29.3	3.0						
SI5X		48 39.3	123 29.3	3.0						
SI5Y		48 39.3	123 29.3	3.0						
SI6X		48 39.3	123 29.3	3.0						
SI6Y		48 39.3	123 29.3	3.0						
SI7X		48 39.3	123 29.3	3.0						
SI7Y		48 39.3	123 29.3	3.0						
SI8X		48 39.3	123 29.3	3.0						
SI8Y		48 39.3	123 29.3	3.0						
SI9X		48 39.3	123 29.3	3.0						
SI9Y		48 39.3	123 29.3	3.0						

CRUISE 84–SI (Saanich Inlet)

Station	SI1X	SI1Y	SI2X	SI2Y	SI3X	SI3Y	SI4X	SI4Y
Taxon								
ochromonas spp.	5985	6498	5073	5244	8436	7752	9690	9633
dictyocha speculum	8	3	9	4		3		5
pseudopedi pyriformis	22	12		8	13	9		5
apedinella spinifera	36	30	22	26	48	39	41	57
imantonia rotunda	20860	20520	18240	1938	18810	18350	1596	15730
chrysochro spp. 3–6	3276	3080	2520	2828	2716	2380	1890	1810
skeletonem costatum					39	44		
thalassios spp.	10	2					6	9
thalassios conferta	218	180	122	151	236	181	44	38
thalassion nitzschoides	23	21	27	25	10	13	6	8
nitzschia americana	45	33	45	38	23	25	12	11
nitzschia bicapitata	8						6	7
nitzschia closterium	462	448	430	470	528	482	172	209
nitzschia delicatissim	104	96	77	80	99	93	63	55
nitzschia granii v.curvata	20	12		20	21	17	18	10
nitzschia longissima	42	50	51	54	69	62	14	18
micromonas pusilla?	200700	184300	100400	108500	182300	172000	1197	1425
nephroselm spp. /bipedinomon	10	13		12	45	26	18	65
tetraselmi spp. /pyramimonas	204	161	85	101	213	172	199	263
pterosperm spp. /pachysphaer					8	5		7
eutreptiel spp.				2	4			
prorocentr balticum		8	15	11	24	24	24	15
gymnodiniu spp.	45	51	7	70	60	68	118	97
gymnodiniu gracilentum	127	99	44	52	88	92	136	119
katodinium rotundatum	90	91	91	100	204	173	55	90
peridiniac spp.					4	3	3	4
raphidophy sp.1	32	41	63	69	80	85	90	
heterosigm akashiwo								107

Continued	SI1X	SI1Y	SI2X	SI2Y	SI3X	SI3Y	SI4X	SI4Y
cryptomona spp. 5–10	6888	6748	7923	6954	5814	5814	2856	3276
cryptomona spp. 11–20	805	820	675	680	1485	1200	1740	1700
hemiselmis spp. 4–6	4340	3556	1820	2184	4452	3976	3136	4032

CRUISE 84–SI (Saanich Inlet)

Station / Taxon	SI5X	SI5Y	SI6X	SI6Y	SI7X	SI7Y	SI8X	SI8Y
ochromonas spp.	4424	3976	3416	2884	1792	1680	1400	1652
dictyocha speculum			7	5	7	5		1
pseudopedi pyriformis	6	3		5	8	4		8
apedinella spinifera	53	60	76	71	70	64	52	67
imantonia rotunda	9234	9975	7504	9063	9348	8664	6832	7196
chrysochro spp. 3–6	1340	1310	1370	1280	1160	1140	1045	1100
skeletonem costatum		22	12	10	17	8		12
thalassios spp.	11	10	15	12		7	9	6
thalassios conferta	39	47	98	87	47	50	52	50
thalassion nitzschoides	6	4		7	4			6
nitzschia americana	10	18	7	7	4	10	11	
nitzschia bicapitata	5		5	4				
nitzschia closterium	181	211	272	252	164	170	164	157
nitzschia delicatissim	43	46	6	5	46	52	48	46
nitzschia granii v.curvata	25	19	23	27	23	18	10	7
nitzschia longissima	27	19	9	12	9	10	10	16
micromonas pusilla?	1026	1140	969	912	1083	969	855	1026
nephroselm spp. /bipedinomon	26	32	40	50	47	41	38	40
tetraselmi spp. /pyramimonas	1910	226	300	210	82	76	56	68
pterosperm spp. /pachysphaer	10	6	6	8		10	5	10
eutreptiel spp.		4			3	2		3
prorocentr balticum	12	13	16	11	5	7	9	5
gymnodiniu spp.	54	61	84	78	62	56	47	48
gymnodiniu gracilentum	36	36	38	43	45	40	29	25
katodinium rotundatum	73	78	91	84	47	42	27	32
peridiniac spp.		7	5	6	3	5	5	1
raphidophy sp.1	108	115	115	111	81	81	63	50
cryptomona spp. 5–10	4060	3556	3920	3696	3136	3192	2520	2492

Continued	SI5X	SI5Y	SI6X	SI6Y	SI7X	SI7Y	SI8X	SI8Y
cryptomona spp. 11–20	1060	1210	1390	1270	1030	970	840	880
hemiselmis spp. 4–6	1652	2072	1148	1190	2100	1876	742	700

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Station	SI9X	SI9Y
Taxon		
ochromonas spp.	5700	4928
dictyocha speculum		4
pseudopedi pyriformis		6
apedinella spinifera	51	38
imantonia rotunda	10260	9690
chrysochro spp. 3–6	2050	1870
skeletonem costatum	26	10
thalassios spp.	2	5
thalassios conferta	48	26
nitzschia americana	5	8
nitzschia bicapitata		7
nitzschia closterium	106	122
nitzschia delicatissim	44	36
nitzschia granii v.curvata		7
nitzschia longissima	22	20
micromonas pusilla?	1026	855
nephroselm spp. /bipedinomon	42	56
tetraselmi spp. /pyramimonas	101	84
pterosperm spp. /pachysphaer	6	
eutreptiel spp.	2	
prorocentr balticum	8	4
gymnodiniu spp.	75	67
gymnodiniu gracilentum	22	30
katodinium rotundatum	52	43
peridiniac spp.	2	5
raphidophy sp.1	66	77
cryptomona spp. 5–10	2828	2744
cryptomona spp. 11–20	1040	960

Continued	SI9X	SI9Y
hemiselmis spp. 4–6	2730	2380